JOURNAL
OF THE
Department of Agriculture
OF
WESTERN AUSTRALIA

Vol. 23. (Second Series) SEPTEMBER, 1946. No. 3.

# Preparing the Farm Seed Supplies.

I. THOMAS, Superintendent of Wheat Farming.
A. J. MILLINGTON, Plant Geneticist.
H. G. CARISS, Agricultural Adviser.

IN the quest for higher yields the farmer is concerned with a number of sources of possible loss. When seed bed preparation and planting dates are satisfactory, the highest yields will be obtained from the best seed sample of the variety most suited to the district. The farmer is therefore concerned firstly with the choice of suitable varieties for his district and secondly with ensuring grain supplies of them for seed purposes.

For the 1945 seeding, twelve varieties accounted for over 90 per cent. of the acreage sown to wheat for all purposes in W.A., and 70 per cent. of the total was sown to the three leading varieties. (Samuel 1945). This indicates the importance which farmers attach to the selection of the best varieties of cereals for their district.

The Department of Agriculture is concerned firstly with producing new and improved varieties by crossbreeding and selection, and secondly with ensuring that supplies of pure seed of them are available to farmers. To maintain the variety so that it breeds "true" for the desirable superior characters, the Department maintains pure lines of the recommended cereals. The maintenance of pure line rows involves a pedigree system which immediately reveals any deviation from type.

The surplus seed from the pedigree rows is increased each year until sufficient is available for distribution to the industry. (Fig. 1). The identity and therefore the pedigree of all seed is maintained during the years of increase. Many farmers ensure their supplies by buying each year sufficient pedigree seed from the Department of Agriculture for a small plot which is gradually built up until sufficient is available for planting the whole farm. This system enables the farmer, with appropriate care, to maintain his varieties free of admixture and therefore capable of giving the highest yields within the capacity of that variety.

Numerous experiments have shown that the larger grains will yield more than smaller ones of the same variety. This indicates the desirability of grading seed if maximum yields are to be obtained and all seed distributed from the Research Stations is so treated.

23499/46

To enable Farmers to obtain maximum yields from the standard and improved varieties

# THE DEPARTMENT OF AGRICULTURE DISTRIBUTES

# PURE GRADED PEDIGREE SEED

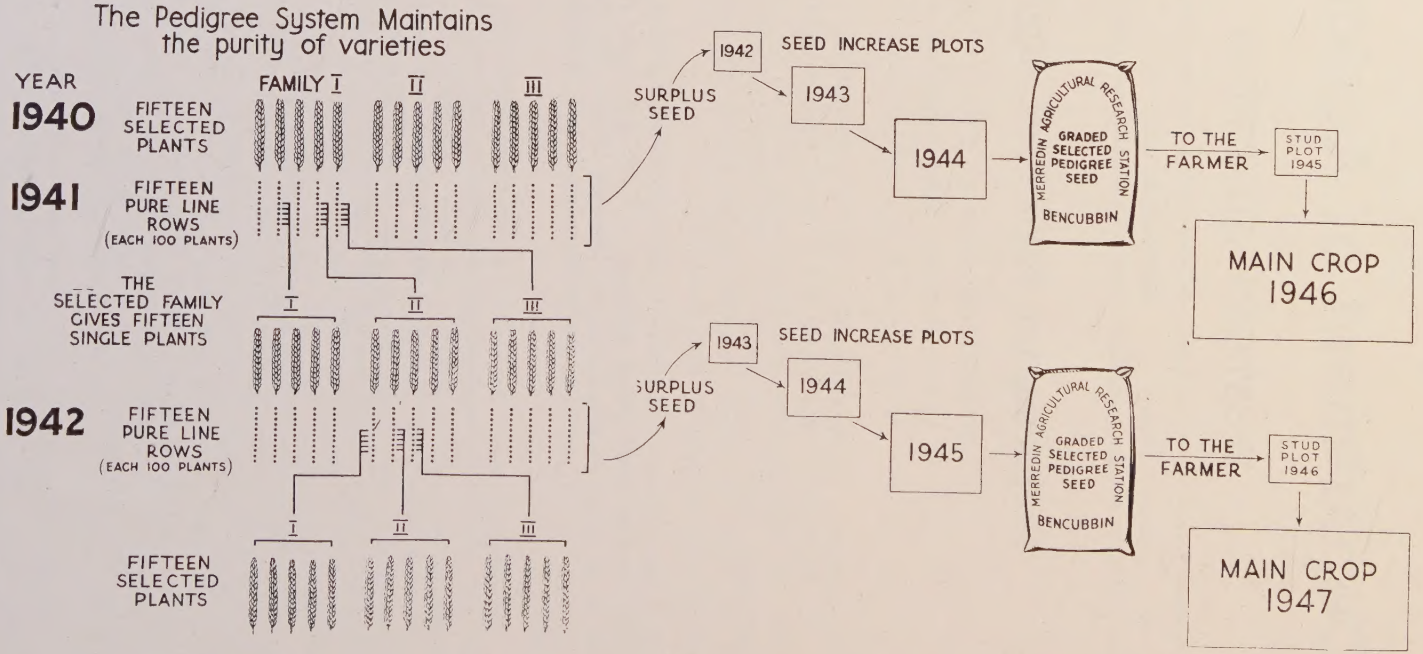


Fig. 1.

In a previous paper by the Authors (1944) the utilisation of the main cereal varieties was discussed. In that paper the wheatbelt was divided into three zones, according to the annual rainfall and for convenience, some of the tables and comments have been included herewith.

The three zones and the Road Board districts included in each are:—

| *Zone* 1. | *Zone* 2. | *Zone* 3. |
|---|---|---|
| *Under* 14 *in.*— | 14–18 *in.*— | 18·20 *in., and above.*— |
| Mukinbudin | Northam | Greenough |
| Mullewa | Northampton | Irwin |
| Morawa | Upper Chapman | Moora |
| Perenjori | Geraldton | Victoria Plains |
| Dalwallinu | Mingenew | Toodyay |
| Dowerin | Three Springs | York |
| Wyalkatchem | Carnamah | Brookton |
| Koorda | Wongan-Ballidu | Cuballing |
| Mt. Marshall | Goomalling | Narrogin |
| Westonia | Meckering | Wagin |
| Nungarin | Corrigin | Katanning |
| Merredin | Kulin | Broomehill |
| Kellerberrin | Quairading | Tambellup |
| Kununoppin | Wickepin | Woodanilling |
| Bruce Rock | Dumbleyung | Esperance |
| Narembeen | Kent | (Southern 1/3) |
| Kondinin | Beverley | |
| Lake Grace | Pingelly | |
| Yilgarn | Gnowangerup | |
| Dundas | Esperance (Northern 2/3) | |

In addition to obtaining a good sample of grain for seed purposes it is essential that each variety should be planted during the appropriate period for its maturity.

The following table has been compiled from collected statistical data and gives the proportionate planting for each maturity in each zone.

| Cereal. | Zone 1. Early. Under 14 in. Rainfall. Chiefly Wheat. | | Zone 2. Midseason. 14 in. to 18 in. Rainfall. Wheat and Sheep. | | Zone 3. Late. 18 in. to 20 in. Rainfall. Sheep and Wheat. | |
|---|---|---|---|---|---|---|
| | Proportion. | Maturity. | Proportion. | Maturity. | Proportion. | Maturity. |
| Wheat | 2/3 | Midseason | 4/5 | Late and midseason | 9/10 | Late and midseason |
| | 1/3 | Early and very early | 1/5 | Early and very early | 1/10 | Early and very early |
| Oats | 1/3 | Midseason | 2/3 | Late and midseason | 3/4 | Late and midseason |
| | 2/3 | Early and very early | 1/3 | Early and very early | 1/4 | Early and very early |
| Barley | ... | Early (fodder) | ... | Early (malting), Early (fodder) | ... | Early (malting), Early (fodder) |

Seeding calendars have also been prepared for each zone covering the recommended varieties and their appropriate planting periods. (Figs. 2, 3, 4.)

It must be mentioned here that the indicated planting periods should be used as a guide with due regard to local conditions, as it will be appreciated that it is not possible to give specific recommendations for individual districts within a zone.

With all cereal plantings it is desirable that the seeding programme commence with the latest maturing variety being planted and be completed with the earlier maturing ones. For maximum yields it is not generally advisable to extend the planting periods for various maturities beyond those indicated. It is very desirable, however, that sufficient seed of both early and mid-season varieties be reserved and kept on hand in order that, if necessary, the areas sown to each can be adjusted to meet seasonal conditions.

With regard to the planting of cereals for green fodder (Cariss 1945), these are normally sown as early as possible in the season, irrespective of the maturity of the variety being used. In this connection the cereal varieties recommended are:—

*Oats*:

Algerian.—Late maturing (high rainfall areas particularly).

Dale.—Mid-season maturing.

Fulghum.—Mid-season maturing (standard grazing oat).

Ballidu.—Early maturing.

Wongan.—Very early maturing.

*Barley*:

Atlas.—Early maturing (very satisfactory).

## WHEAT VARIETIES.

With regard to maturity standards it is customary in Western Australia to classify wheat varieties into four standard maturity groups relative to the control variety, Gluyas Early:—

(i) Very early maturing—flowering five or more days earlier than Gluyas Early.

(ii) Early maturing—flowering four days earlier to three days later than Gluyas Early.

(iii) Mid-season maturing—flowering four to nine days later than Gluyas Early.

(iv) Late and late mid-season—flowering ten or more days later than Gluyas Early.

The following are short descriptions of the recommended varieties which are at present being produced as pedigree seed:—

*Mid-season Varieties.*

*Kondut.*—Bred at the Wongan Hills Light Lands Research Station, Kondut, has yielded well, over a wide range of soil and climatic conditions.

Although not rust resistant, it gives better yields under epidemic conditions than Bencubbin and Nabawa. It is resistant to flag smut.

The straw is stout and the variety can be recommended for early planting, particularly on light land and in rust liable districts.

Kondut yields flour which is usually superior in strength to that of the f.a.q.

*Eureka.*—This variety was bred in New South Wales as a resistant wheat for planting in rust liable districts. A new rust strain has, however, appeared in New South Wales to which Eureka is susceptible. This race has not yet been collected in Western Australia.

Eureka is a stout strawed rather tall growing brown chaffed variety with translucent grain. Under slow ripening conditions the grain frequently mottles. The flour strength of Eureka is well above the f.a.q. of the State. It is resistant to flag smut. The desirable planting date for Eureka in each district would be about the same as for Bencubbin.

*Bencubbin.*—The standard mid-season wheat which is the most extensively grown variety in Western Australia and also Australia. The straw strength tends to be weak on light land but is satisfactory for hay. Bencubbin is notable for its high yields under inferior seasonal conditions. and although very susceptible to rust is resistant to flag smut. Its flour strength is equal to the State f.a.q.

*Early Maturing.*

*Koorda.*—A relatively recent release by the West Australian Department of Agriculture, Koorda has yielded well on the lighter soils where its strong straw is of great value. Koorda is practically immune to flag smut and tends to be rust escaping in all but the heaviest epidemics. The flour strength of Koorda is about the same as that of the f.a.q. standard.

In yield trials on the Research Stations, Koorda has outyielded Merredin a variety which it has been designed to replace.

*Very Early Maturing.*

*Bungulla.*—The standard early maturing variety and a selection from Bencubbin. Like Bencubbin is notable for its high yields, particularly under low rainfall conditions.

Because of its early maturity, it usually suffers relatively little rust damage. The straw strength is satisfactory on the heavier soil types, but Koorda is to be preferred on light soils in all but the drier districts.

Bungulla is satisfactory for hay whilst the flour strength is equal to the f.a.q. of the State. It is resistant to flag smut but not to rust.

*Charter.*—Released in 1944 by the New South Wales Department of Agriculture. Bred by S. L. Macindoe from a cross made at the Glen Innes Experiment Farm in 1931, between a selection of Kenya C6040, resembling C6042 in rust reaction, and Gular.

Highly resistant to all Australian races of stem rust and to flag smut. The straw is tall and though of good quality is apt to lodge when yields are high.

Grain mottles less than Eureka and is of better flour strength, reaching the premium class.

*Hay Variety.*

The variety Baroota Wonder is grown almost exclusively for hay. It is a relatively tall growing wheat and remains green to the base until haycutting time. It is very susceptible to loose smut and rust, but moderately resistant to flag smut.

*Premium Varieties.*

The premium wheats have received this name because in the past millers have paid a premium for them, an extra price over and above f.a.q. prices. Millers have paid these prices because it was considered that the ordinary f.a.q. wheats

gave a flour too weak for the local breadmaking trade and it was thus necessary to blend in some strong or premium wheat flour to build up the f.a.q. varieties to the strength required by the local trade.

From the farmer's point of view the premium wheats yield less bushels per acre than do the f.a.q. varieties. and it is a matter of economics as to whether the increased price, based on the strength of the premium variety, compensates the grower for the decreased yield.

Since in this State the variety Comeback is normally stronger than Pusa IV. when grown under the same conditions it usually commands a higher premium.

In discussing the strength of wheat it must be remembered that soil, district and climate affect this factor not only for the premium varieties, but also for the f.a.q. varieties discussed above. In general, heavy soils yield stronger wheats than do light soils and also the harder the growing conditions the stronger the wheat produced.

*Comeback* is an early maturing variety which generally gives yields of about two-thirds that of the f.a.q. varieties grown under identical conditions. It is resistant to flag smut and is usually rust escaping.

*Pusa IV.* is more prolific than Comeback. It grows very vigorously and matures early. Pusa IV. is resistant to flag smut but not to rust, although it usually escapes major damage.

## OAT VARIETIES.

Oats are notoriously difficult crops to harvest for grain, particularly following adverse weather conditions, and plant breeders therefore, have been particularly concerned with straw strength and non-shedding. The W.A.-bred oat varieties, Dale, Ballidu and Wongan, represent a notable achievement in respect to improved straw strength and ability to withstand unfavourable weather. These three varieties are selections made by Mr. D. R. Bateman at the Wongan Hills Research Station from a Mulga-Burt's Early cross and they fulfil the requirements of a general purpose oat. They are suitable for grain and hay and also for early green grazing and recovery. With their differing maturities they cover the range of the planting season.

Oats are classified as to maturity in much the same manner as are wheats:—

Very Early Maturing: Flowering four or more days earlier than Mulga.

Early Maturing: Three days earlier to six days later than Mulga.

Mid-season Maturing: Seven to fourteen days later than Mulga.

Late Maturing: Fifteen or more days after Mulga.

Oats are being increasingly used as a source of early green feed. They are sown either on fallow or stubble land in early April and fed off six to eight weeks after the opening rain of the season. Varieties vary considerably in their suitability for this purpose both in respect to the quantity of green feed produced and in their ability to recover after grazing.

Oats are used extensively for hay for which purpose the leading varieties are well suited. The present oat breeding programme aims at the development of varieties combining large grain size and straw strength and the retention of the long juvenile phase of Fulghum in a stronger strawed variety.

The following are short descriptions of the recommended varieties which are at present being produced as pedigree seed:—

*Late Maturing.*

*Algerian.*—The standard late general purpose oat which is cultivated chiefly in the Great Southern areas of the wheat belt. It is also used extensively for oatmeal manufacture.

*Mid-season Maturing.*

*Guyra.*—The standard mid-season variety which is notable chiefly for its plump grain. Although a popular hay variety the straw tends to be very coarse under favourable conditions of growth and lodging frequently occurs where crops are left for grain. Guyra is an indifferent variety for grazing and recovery since the early growth is relatively sparse and the grain yields, subsequent to grazing, only fair.

*Fulghum.*—The standard grazing and recovery oat, but is not a good general purpose variety as the straw strength is very poor. Fulghum is used principally for grazing and recovery since the notable length of its leafy growth phase prior to "shooting" enables it to be grazed later in the season than other mid-season varieties. As a grazing oat the initial growth is not as vigorous as that of Dale but it is, however, very suitable for late winter or early spring feed.

The grain of Fulghum is suitable for oatmeal manufacture.

*Dale.*—This has given satisfactory results as a general purpose variety under a wide range of conditions. It is markedly superior to other mid-season varieties in respect to straw strength and is very suitable for early grazing.

*Early Maturing.*

*Ballidu.*—The standard early oat which has demonstrated its general superiority to Mulga in trials on research stations and is proving very satisfactory on farmers' holdings. The straw strength and grain yields are outstanding whilst its vigorous leafy early growth and satisfactory recovery make it suitable for grazing and recovery.

*Very Early Maturing.*

*Wongan.*—The standard very early maturing oat which is notable for its vigorous early growth and strong straw. It is satisfactory as a hay variety although it is often rather short strawed. As a grain variety, it stands well but tends to shed if left unharvested too long after it has matured.

The vigorous early growth makes Wongan a suitable variety for early winter feed, but it cannot be grazed as late in the season as Ballidu and the mid-season varieties if recovery for grain is desired.

## BARLEY VARIETIES.

Barleys are normally classified as being either two-row or six-row types and according to their suitability or otherwise for malting.

Suitable malting barleys are found both in the two-row and six-row types, but local maltster's technique is based upon the use of the two-row types. Prior to the outbreak of war there was an expanding export of six-row malting types to the United Kingdom, but this has, owing to shipping and other difficulties, been temporarily suspended.

The selection of barley varieties for seed depends, therefore, upon the purpose for which the crop is to be grown. Practically all varieties in cultivation in Western Australia are early maturing and therefore the planting date will be dependent upon whether the crop is to be used for malting grain, fodder grain or green feed.

Barley for malting purposes is usually seeded during the latter half of May. When grown as a feed grain it is planted when convenient, usually after the wheat and oats have been sown. Barley for green grazing is customarily sown in April.

Description of the two recommended varieties are:—

*Atlas.*—A six-row malting type barley introduced from California. It is also known in this State as Californian six-row barley. It is used in England for malting purposes in the production of light sparkling bottle beer and prior to the war exports of suitable samples were increasing substantially. This barley is also eminently suitable for early green feed for which purpose it is at present mainly grown; a small quantity is used for malting locally in order to maintain a nucleus of the industry. It is very suitable also for feed grain purposes, being superior in yielding capacity to Cape. The results of trials with this typical six-row barley indicate that it is superior to oats as a source of early green feed, particularly at the time of the first grazing.

*Prior.*—A two-row barley which is the most important malting variety grown in the Commonwealth. Although it is generally considered that Prior is a strain of English Archer malting barley, there is no record of the variety from which it actually originated or the methods by which it was developed. This variety, which proved to be much more prolific and superior in malting quality to other malting barleys, was named after Mr. Samuel Prior, of Brighton, South Australia, who obtained one bag of seed of unknown origin from an Adelaide seedsman in 1900. It was from this seed that the strain was developed, Messrs. Barrett Bros., maltsters of South Australia, being responsible for its initial distribution. Prior is also a useful variety for green fodder purposes.

## PURE SEED DISTRIBUTION.

As mentioned earlier the production of pedigree seed is a major function of the Wheatbelt Research Stations and over the past ten years approximately 4,000 bags of pedigree wheat, oats and barley seed has been made available to farmers annually.

For distribution from the current harvest it is anticipated that seed of the recommended varieties described earlier in this paper will be available.

The general policy of the distribution scheme is to supply as many farmers as possible with small quantities of seed to establish their own "stud" plots and therefore it is usually necessary to limit the number of bags of any one variety supplied to each applicant, and on some occasions to limit the number of varieties.

The conditions of purchase for the current season will be that the seed will be supplied on a *cash basis only.*

The cash prices for wheat, oats and barley, inclusive of rail freight to applicant's siding, will be:—

| | per bag of 3 bushels. |
|---|---|
| *Wheatbelt Areas*— | |
| Wheat and Barley .. .. .. | 22s. 6d. |
| Oats .. .. .. .. .. | 15s. |
| *South-West Areas*— | |
| Wheat and Barley .. .. .. | 22s. 6d. |
| Oats .. .. .. .. .. | 16s. 6d. |

In order to avoid disappointment in obtaining their requirements, farmers will assist considerably by noting the following directions:—

(1) All applications should be made *direct* to the Department of Agriculture, Perth.

(2) Applications should include the full name and postal address of the applicant and also the *siding* to which he desires the seed to be railed.

(3) Make early application.

(4) Forward cash remittance as soon as possible after receipt of statement of account. Statements of account are sent out in order of receipt of application.

(5) No definite reservations can be made until after receipt of the necessary cash remittance.

## SEEDING CALENDARS.

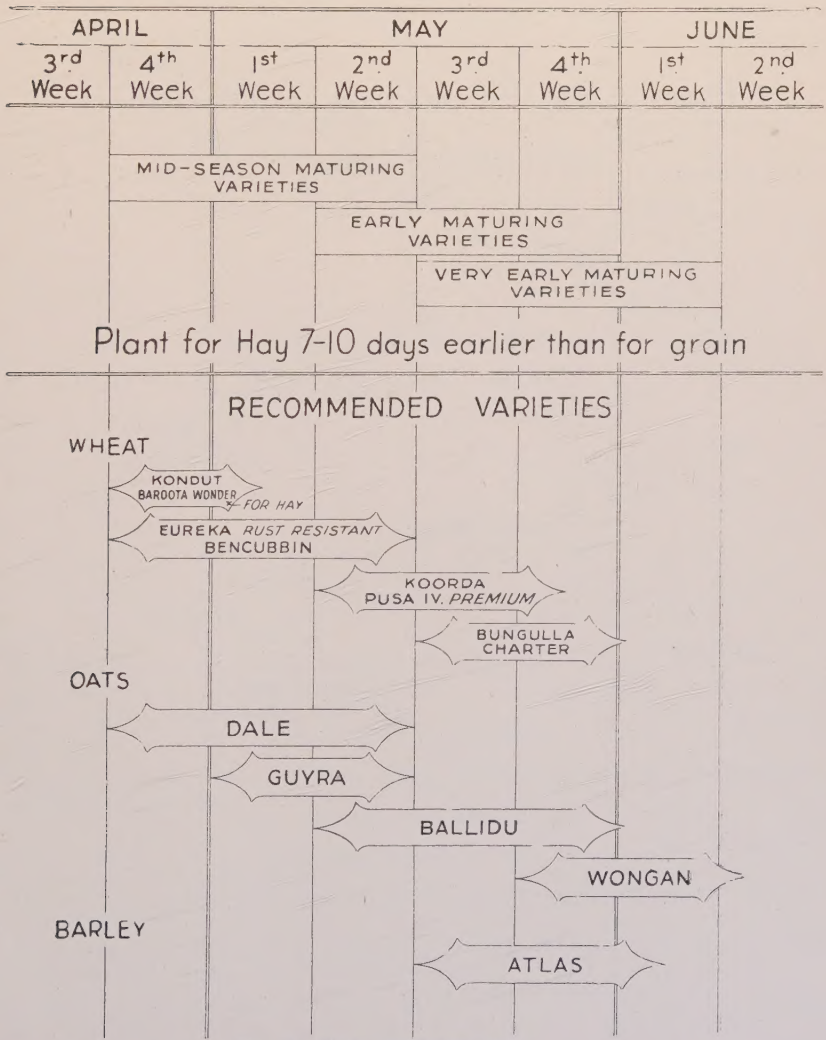


Fig. 2.—Early maturing zone.

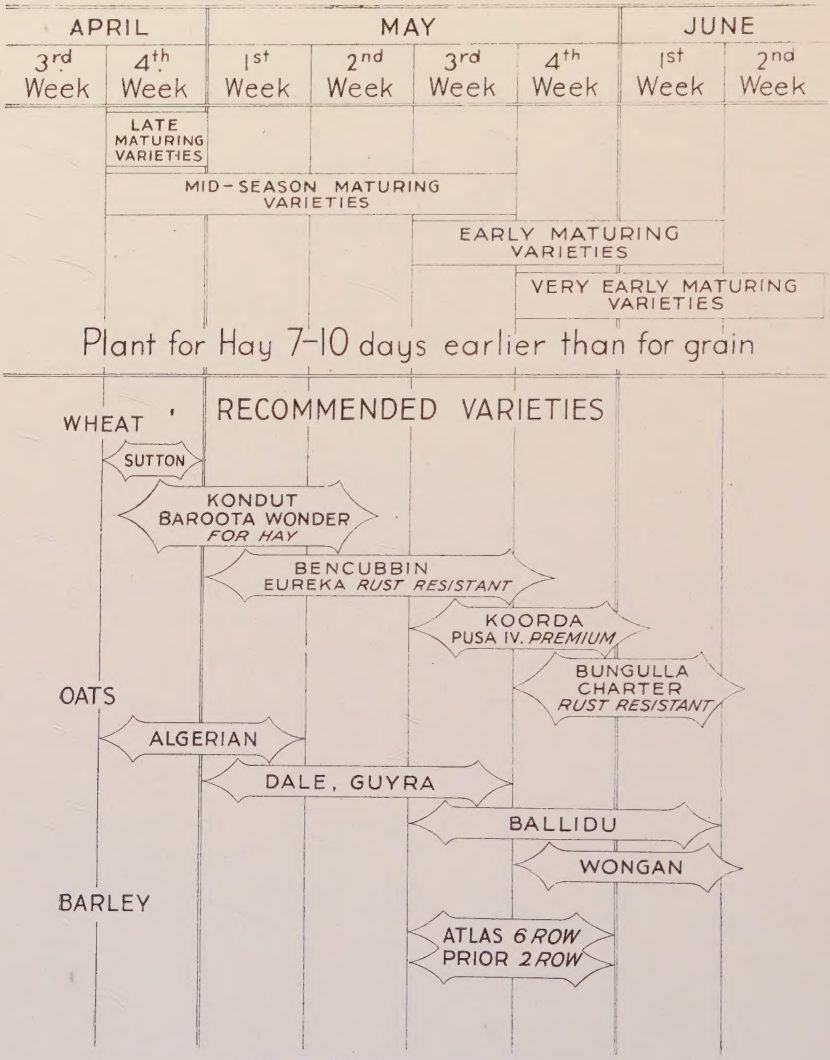


**Fig. 3.—Mid-season maturing zone.**

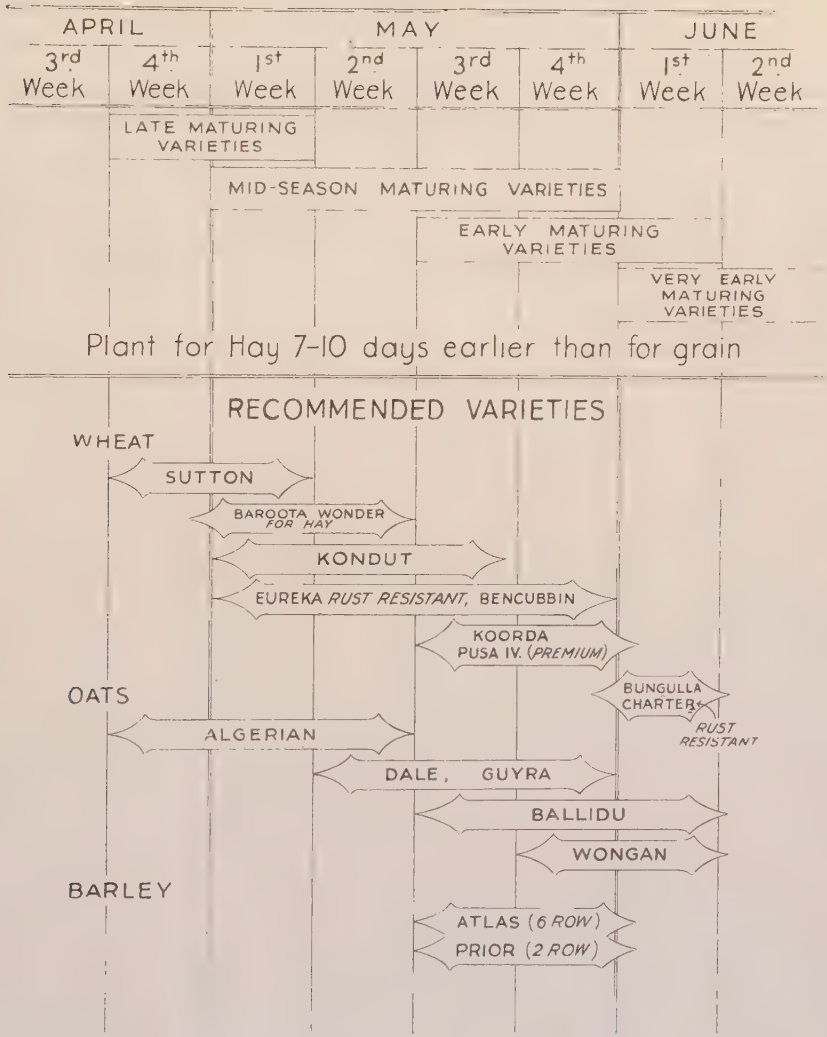


Fig. 4.—Late maturing zone.

## ACKNOWLEDGMENT.

The authors are indebted to the Chief Draughtsman, Lands Department, for the drawing of the figures.

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Samuel, L. W.: "Areas sown to individual varieties of wheat in Western Australia." Jour. Agric. West. Aust. 22. 2nd series, 293-294.

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## The following additional Fertilisers have been Registered at the Department of Agriculture under the Fertiliser Act, 1928, for the Year commencing 1st November 1945.

| Name of Fertiliser. | Reg. No. | Brand. | By whom Registered. | Nitrogen (N) as | | | | Phosphoric Acid ($P_2O_5$) as | | | | Potash ($K_2O$) as | | Cash Price per ton on rails at Works† or Perth.‡ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Nitrate. | Ammonia. | Blood and Bone | Bone-dust | Water Sol. | Citrate sol. | Acid sol. | TOTAL | Sulphate. | Muriate. | |
| 1.—*Nitrogen Phosphoric Acid and Potash.* | | | | % | % | % | % | % | % | % | % | % | % | £ s. d. |
| Potato Manure "A" .... .... | 70 | Sickle .... .... | Cuming Smith & Mt. Lyell F.F. Ltd. | .... | 2·50 | .... | .... | 10·00 | 1·75 | 1·25 | 13·00 | 5·00 | .... | 9 15 11† |
| Do. "B" .... .... | 71 | do. .... .... | do. do. | .... | 3·50 | .... | .... | 9·50 | 1·50 | 1·25 | 12·25 | 5·00 | .... | 10 8 3† |
| Do. "A" .... .... | 72 | C.S.M.L. .... | do. do. | .... | 2·50 | .... | .... | 10·00 | 1·75 | 1·25 | 13·00 | 5·00 | .... | 9 15 11† |
| Do. "B" .... .... | 73 | do. .... .... | do. do. | .... | 3·50 | .... | .... | 9·50 | 1·50 | 1·25 | 12·25 | 5·00 | .... | 10 8 3† |
| Do. "A" .... .... | 74 | ML in diamond.... | do. do. | .... | 2·50 | .... | .... | 10·00 | 1·75 | 1·25 | 13·00 | 5·00 | .... | 9 15 11† |
| Do. No. 3 .... .... | 75 | do. .... .... | do. do. | .... | 3·50 | .... | .... | 9·50 | 1·50 | 1·25 | 12·25 | 5·00 | .... | 10 8 3† |
| Orchard Manure .... .... .... | 63 | Cresco .... .... | Cresco Fertilisers (W.A.), Ltd. | 5·00 | .... | .... | .... | 7·00 | 1·25 | ·75 | 9·00 | .... | 9·80 | 14 8 11† |
| 2.—PHOSPHATIC. | | | | | | | | | | | | | | |
| Superphosphate .... .... .... | 64 | Sickle .... .... | Cuming Smith & Mt. Lyell F.F. Ltd. | .... | .... | .... | .... | 15·00 | 2·50 | 1·50 | 19·00 | .... | .... | 5 8 6† |
| | 65 | ML in Diamond | do. do. | .... | .... | .... | .... | 15·00 | 2·50 | 1·50 | 19·00 | .... | .... | 5 8 6† |
| | 66 | C.S.M.L. .... | do. do. | .... | .... | .... | .... | 15·00 | 2·50 | 1·50 | 19·00 | .... | .... | 5 8 6† |
| | 68 | Cresco .... .... | Cresco Fertilisers (W.A.), Ltd. | .... | .... | .... | .... | 15·00 | 2·50 | 1·50 | 19·00 | .... | .... | 5 8 6† |
| ORGANIC. | | | | | | | | | | | | | | |
| (a) *Blood and Bone* .... .... | 67 | Wyndham .... | Wyndham Freezing, Canning and Meat Export Works | .... | .... | 5·75 | .... | .... | 6·00 | 9·00 | 15·00 | .... | .... | 10 12 6‡ |
| MISCELLANEOUS. | | | | | | | | | | | | | | |
| (c) *Fish Fertiliser* .... .... .... | 69 | Cormo .... .... | Norwest Fertilisers .... | .... | .... | 5·00 | | .... | .... | 8·00 | 8·00 | .... | .... | On application. |

## The following Amendments to the list published in the December Journal 1945 have been Registered.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulphate of Potash .... .... | 59 | C.S.M.L. .... .... | Cuming Smith & Mt. Lyell F.F., Ltd. | .... | .... | .... | .... | .... | .... | .... | .... | 30·00 | .... | 16 13 0 |
| Potato Manure "C" .... .... | 22 | Sickle .... .... | do. do. | .... | 3·50 | .... | .... | 11·75 | 2·00 | 1·50 | 15·25 | .... | .... | 8 8 10† |
| Do. No. 2 .... .... | 32 | ML in Diamond | do. do. | .... | 3·50 | .... | .... | 11·75 | 2·00 | 1·50 | 15·25 | .... | .... | 8 8 10† |
| Do. "C" .... .... | 41 | C.S.M.L. .... | do. do. | .... | 3·50 | .... | .... | 11·75 | 2·00 | 1·50 | 15·25 | .... | .... | 8 8 10† |
| Tomato Manure .... .... | 48 | do. .... .... | do. do. | .... | 3·50 | .... | .... | 11·75 | 2·00 | 1·50 | 15·25 | .... | .... | 8 8 10† |
| Tobacco Manure No. 5 .... .... | 49 | do. .... .... | do. do. | 2·80 | | .... | .... | 10·00 | 1·50 | 1·25 | 12·75 | .... | 8·00 | 11 18 6† |
| Orchard Manure .... .... .... | 60 | Sickle .... .... | do. do. | 5·0 | .... | .... | .... | 11·25 | 1·75 | 1·35 | 14·35 | 2·50 | .... | 9 1 8† |
| Do. .... .... .... | 61 | C.S.M.L. .... | do. do. | 5·0 | .... | .... | .... | 7·50 | 1·25 | 0·75 | 9·50 | .... | 9·80 | 14 8 11† |
| Do. .... .... .... | 62 | ML in Diamond | do. do. | 5·0 | .... | .... | .... | 7·50 | 1·25 | 0·75 | 9·50 | .... | 9·80 | 14 8 11† |
| | | | | | | | | 7·50 | 1·25 | 0·75 | 9·50 | .... | 9·80 | 14 8 11† |
| Superphosphate and Copper Ore .... | 26 | "Florida" .... | do. do. | .... | .... | .... | .... | 12·30 | 2·00 | 1·50 | 15·80 | Copper 1·60 | Oxide | 7 8 4† |
| Do. do. do. | 45 | C.S.M.L. .... | do. do. | .... | .... | .... | .... | 12·30 | 2·00 | 1·50 | 15·80 | 1·60 | | 7 8 4† |

# Sheep Yards at Research Stations.

I. Thomas, Superintendent of Wheat Farming.

H. G. Cariss, Agricultural Adviser.

## INTRODUCTION.

With the carrying of sheep on wheatbelt farms assuming greater importance, the question of the erection of compact and efficient sheep drafting yards must receive attention. Consideration must also be given to the provision of suitable facilities for shearing and the construction of a sheep dip.

It is desirable that sheep yards, shearing shed, and sheep dip be a compact workable unit. If it is not possible for the main yards to be constructed in association with the shearing shed, then a small set can be erected as has been the case at the Salmon Gums Research Station.

Generally speaking, when planning sheep yards it is better to err on the larger side and make provision for the handling of a greater number of sheep than is actually required at the moment.

Sheep yards are either rectangular or circular in construction, the latter type being erected at all the wheatbelt research stations, and in this paper, the design and construction of several of the research station yards are described and illustrated.

Plans and specifications for a set of circular yards capable of handling 1,000 to 1,500 sheep are included and the methods of construction discussed (Figs. 9 & 10).

## THE CONSTRUCTION OF SHEEP YARDS.

Irrespective of whether the yards are rectangular or circular in design there are a number of salient factors to be taken into consideration in their erection.

(i) For the most efficient handling of sheep at all times of the year, it is essential that such yards be compact and well laid out. They should also be constructed so that, when the occasion arises, any sheep can be manhandled with the minimum amount of exertion by the operator, and least harm to the sheep.

(ii) As the design and layout of sheep yards can be made to conform with any existing buildings which may be utilised for shearing or crutching, any extra gates and races should be provided for in the initial layout (Fig. 10).

(iii) The drafting race should be constructed so that one side is in line with the centre fence through the yards, the reason for this being, that should a stoppage occur whilst drafting, the gate can be so swung that the leading sheep has an uninterrupted view of those already in the check pen (Fig. 1).

(iiia) The gates from the branding race should be so arranged to permit of ease of operation with least interruption to the movement of the sheep from the race and also between the receiving yards (Fig. 11).

(iv) The height of the posts, which should not be more than 6ft. apart between centres, is 3ft. 6in., and they should be at least 2ft. in the ground. The posts themselves may be of sawn timber, bush timber or concrete. Old condemned sleepers are not usually recommended as they tend to rot more readily than new timber. With concrete posts care must be taken that they are sufficiently well

reinforced. When bush timber is used, and sufficiently large posts are not available, then it is advisable to use two individual posts for each panel, making each a separate unit (Fig. 2).

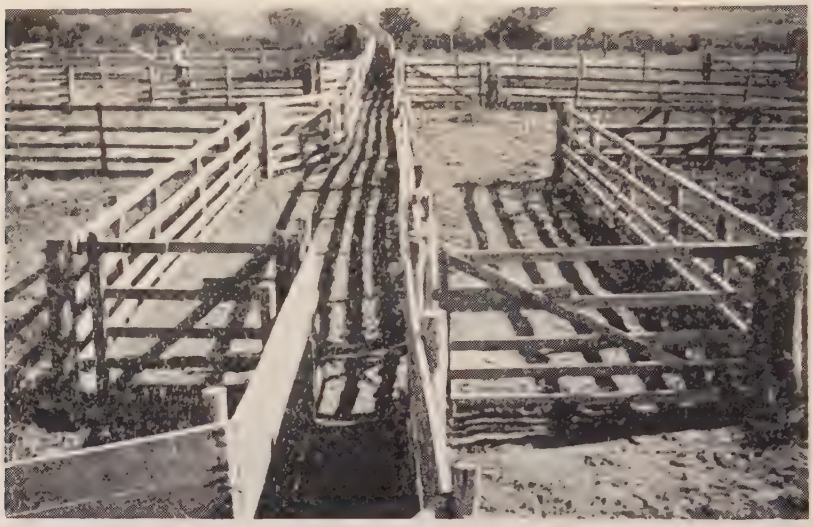


Fig. 1.—Drafting race and check pens as at Wongan Hills Research Station.

Fig. 2.—Individual fence panel of bush timber as at Salmon Gums Research Station.

(v) The joins of the rails should be butted not lapped and the bottom rail not more than 3in. from ground level. For preference the rails should be laced on with wire (Figs. 2 and 12). It will be noted that, with the boards, only one hole through the board near the top is needed and with the "bush" timber rails, only the end ones need to be bored. With any type of rail the use of too many holes should be avoided.

(vi) When available, the timber most suitable for the rails is 6in. x 1in. jarrah, with four rails per panel. When "bush" (unsawn) timber is used five rails per panel are required, and, for durability, they should be not less than 2in. in diameter at the small end (Figs. 2 and 12).

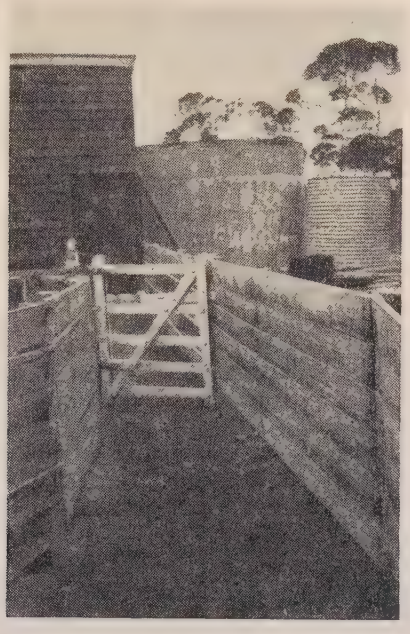


Fig. 3.—Entrance to drafting race (left centre) showing close-boarding of crush. Salmon Gums Research Station.

(vii) It is desirable that the latter part of the crush pen as well as the race be close boarded with 6in. x 1in. jarrah (Fig. 3).

(viii) As gates are a most important feature of all sheep yards, particular attention should be paid to their construction. They should be reasonably light but sufficiently strong to withstand normal wear and tear. The gates, themselves, should be either all metal or of sawn timber. The sawn timber type of gate is usually made out of 3in. x 1in. or 4in. x 1in. full dressed karri or wandoo timber, and of five-bar construction (Fig. 13).

(ix) Gates should be so placed that the sheep can be readily returned to the crush pens for redrafting if required. They should, wherever possible, be swung so as to follow the main movements of the sheep through the yards.

(x) The actual width of the gate-way, of course, must be such as to allow for the hinges and gudgeons and therefore for convenience the gates could be hung before construction of the fence panels.

(xi) The centre type double strap hinge and gudgeon will generally be found the most useful, as this type allows full freedom of swing to the gates.

(xii) To assist the trucking of sheep to market, etc., it is of advantage to include pens of a capacity equal to at least one deck of a small railway sheep

truck. The check pens (Fig. 9) hold approximately 40 woolly sheep each, which is the capacity of one deck of a small truck. The average capacities of the various types of railway trucks are as follows:—

| Truck. | Woolly Sheep. | Spring Lambs. |
|---|---|---|
| C | 70-75 | 90 |
| CXA | 80 | 100 |
| S | 140-150 | 180 |
| SX | 160 | 200 |

## CIRCULAR SHEEP YARDS.

Though the design and construction of the circular type sheep yard is not new, it has been found to be most convenient for handling both large and small flocks of sheep, and as a result of experience gained over a number of years, some improvements have been made.

The circular type of yard has the merit of being compact and convenient for handling sheep, irrespective of whether the whole or only a portion of a farmer's flock is to be handled at the one time. One of the many advantages is the ease with which the sheep in the inner yards can be handled, including redrafting if necessary, without interfering with the sheep in other yards.

The main features of this type of yard are the inner and outer circles which are so arranged that both form part of the crush to the drafting race. The width of the crush pen may be altered very simply by changing the distance between the centres of the two circles.

A reduction or increase in the capacity of the yards is achieved by increasing or decreasing the radii of the two circles. This necessitates also, the increasing or decreasing of the distance between the two centres so that the width of the crush pen, as it enters the drafting race, remains the same. Therefore, to increase the size of the outer yard, the centre of that circle would be moved towards the point "S" (Figs. 9 and 10), and the same procedure would apply to the enlarging of the inner yards. The usual practice for determining the capacity of sheep yards is to allow 4 square feet per sheep.

Before commencing the actual construction, it is as well to lay out the yards first by placing pegs at the two centres, marking the circles on the ground with a mattock or pick, and placing pegs to indicate the corners and gateways (Fig. 10). By doing this a rough outline of the general design of the yard can be seen and any adjustments to advantage made.

It will be noted, also, that provision is made for utilising the crush pens to the drafting race in conjunction with the race leading to the sheep dip.

The estimated quantity of 6in. x 1in. sawn timber, required for construction of these yards is set out below:—

| | | |
|---|---|---|
| Total length of fencing, exclusive of race to dip | = | 850ft. approx. |
| = say 142 panels each 6ft. @ 24ft. per panel | = | 3,408ft. approx. |
| Extra boarding for race and crush .. .. .. | = | 180ft. approx. |
| | | 3,588ft. approx. |

With "bush" timber a minimum of 700 6ft. rails will be required. In addition approximately 420 ft. of 6in. x 1in. jarrah will be needed for the close boarding of the race and crush pen. Provision should be made for approximately 200 posts, inclusive of gate posts; this quanti y would need to be increased when the smaller posts are used.

## YARDS AT THE RESEARCH STATIONS.

### 1. *Wongan Hills Research Station.*

The plan of the yards at this station includes the dip and shearing shed layouts. It will be noted (Figs. 1 and 14) that the dip is situated on the opposite side of the yards to those already described. The sheep to be dipped pass through the drafting race, check pen, branding race and then through a moveable race to the ramp at the entrance of the dip. Having the dip in this position has been found to be rather unsatisfactory and it is suggested that the dip be located as on the main plan (Fig. 9).

The shed is a combined barn and shearing shed, and therefore, to enable the whole to be used for storage, the fittings for the pens have been made removable and are stored away when not in use.

For ease of branding after shearing, it might be desirable to have a race in the yard into which the sheep are counted (Figs. 4 and 14).

Fig. 4.—Counting out pens as at Wongan Hills Research Station.

With these yards the inner or main working yards and crush pen were constructed with timber rails, 3in. x 1½in. rough jarrah being used with five rails per panel and the last few panels of the crush pen and the race close boarded with 6in. x 1in. jarrah boards (Fig. 1). For the outer and receiving yards 3in. x 36in. marsupial netting on an ordinary 6-wire fence was used.

The use of the netting fencing reduces the cost quite considerably but the all-timber construction is preferred on account of durability.

### 2. *Salmon Gums Research Station.*

The yards at this station, with the exception of the race and crush pen, are constructed wholly of "bush" timber (Figs. 5 and 6). The individual fence panels have been treated as separate units as it was considered that this method would make a stronger and more satisfactory job than if single posts were used (Fig. 2). Except where essential the rails have not been bored for the fastening wires.

At this station, also, a set of yards have been constructed alongside the shed used for shearing. The plan of these yards and the sheep pens in the shed have been included (Figs. 7, 15 and 16), for the information and guidance of a farmer who may have a similar type of shed. The gratings and shearing boards are removable for cleaning and storage, and, if desired, could be procured ready-made

in suitable sizes from the timber merchants. As will be seen (Fig. 7) the small set of yards which is capable of handling 400-500 sheep, is constructed with sawn timber.

Fig. 5.—General view of sheep yards as at Salmon Gums Research Station.

Fig. 6.—Inner receiving yards, Salmon Gums Research Station.

Fig. 7.—General view of shearing shed yards at Salmon Gums Research Station.

3. *Avondale, Chapman and Merredin Research Stations.*

The yards erected at the Avondale, Chapman and Merredin Research Stations are practically identical in design and though no layouts are included the following comments are of interest:—

At Avondale the ramp to the dip has been so constructed that it can also be used for the loading of sheep and fat lambs on to motor trucks. The branding race is also used when weighing the export lambs and other sheep, the scales being placed at the end farthest from the drafting race.

At Merredin (Fig. 8) the square type catching pen for the dip is at present erected, but it is intended, however, to replace this with the circular type.

Fig. 8.—Sheep dip at Merredin Research Station.

## SHEEP DIPS.

As the dipping of sheep in the agricultural areas is compulsory, it is desirable that provision be made for a suitable type of dip in association with the sheep yards.

Plans for a suitable dip have, therefore, been included in this paper (Figs. 17, 18 and 19). The following main points should be noted:—

1. The minimum length of the dip should be 30ft. including a 10ft. walk out.

2. The depth of dip to water level be 5ft. and 5ft. 6in. overall. The dip to be 20in. wide at the top and 9in. at the bottom. It is of advantage if the floor of the dip is sloped to one end with say a fall of 1in. to 10ft. to assist cleaning out.

3. The walls of the dip be constructed of 4in. of concrete with a 9in. cap.

4. Suitable dimensions for the two draining pens are 12ft. x 12ft. each.

5. The race to the catching pen should be narrow, i.e., not more than 20in. wide (inside measurement).

Three different types of entrances to the dip are included, namely, the elevated ramp, the square catching pen and the circular catching pen (Figs. 9 and 20) and require little additional comment. With regard to the circular type, however, this appears to be most suitable for a farmer, as two men on their own can, if necessary, dip the sheep quite conveniently. With this type the sheep can be kept up to the catcher by the movement of one of the gates by the second man. Fig. 20 shows the layout of the pen, dip and draining pens, and Fig. 21 the design and method of swinging the two gates. The most suitable post for the purpose is possibly a piece of 4in. wrought iron water-pipe, an ordinary wooden post could be adapted, but it would need to be of not less than 6in. in diameter at the small end.

## ACKNOWLEDGMENTS.

The authors are indebted to the Assistant Superintendent of Wheat Farming (Mr. F. L. Shier) and other officers of the Wheat Branch for their advice, criticism and assistance in the preparation of this paper and to the Chief Draughtsman, Lands Department, for the drawing of the plans.

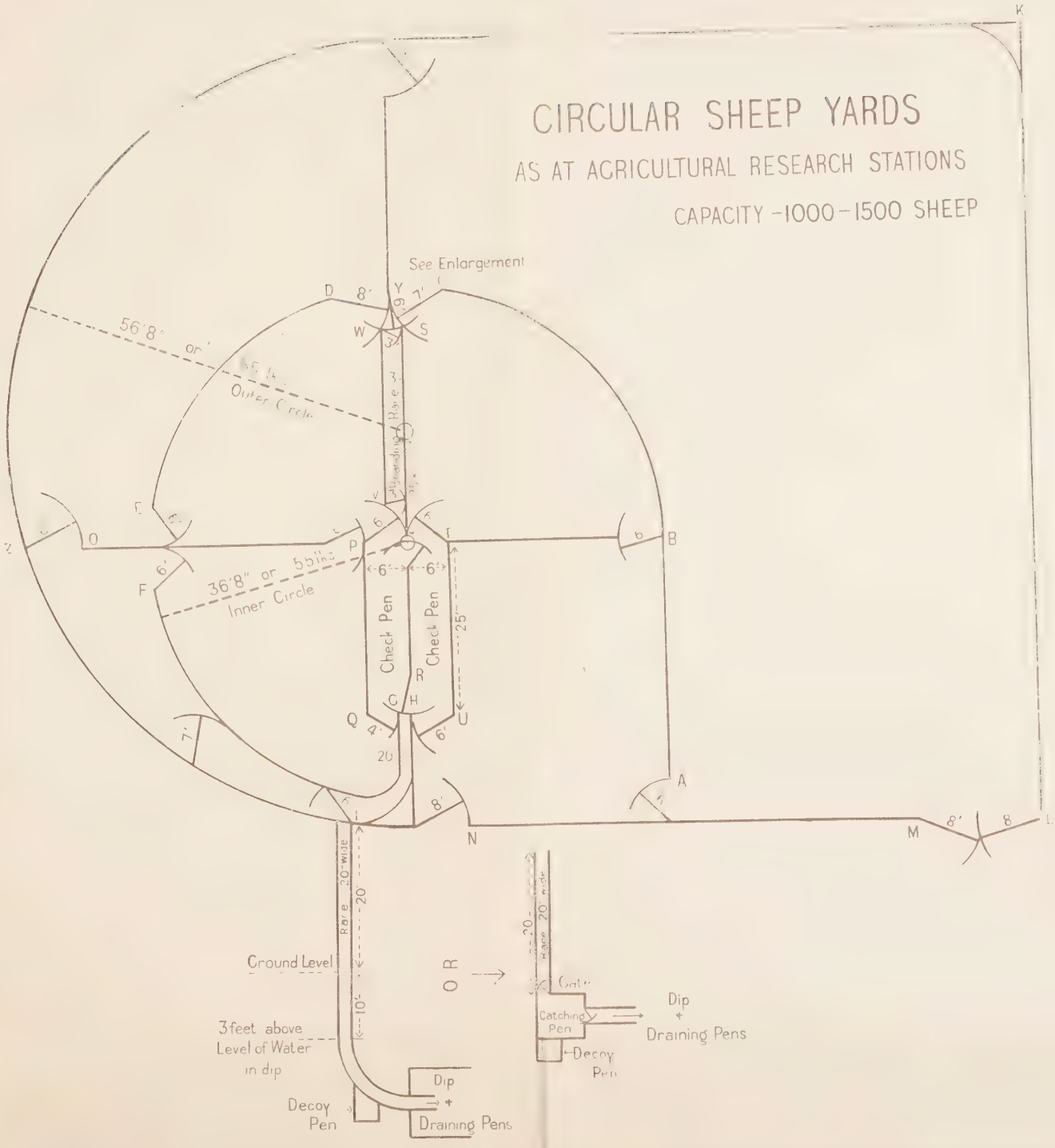



Fig. 9.—Layout of circular type sheep drafting yards.

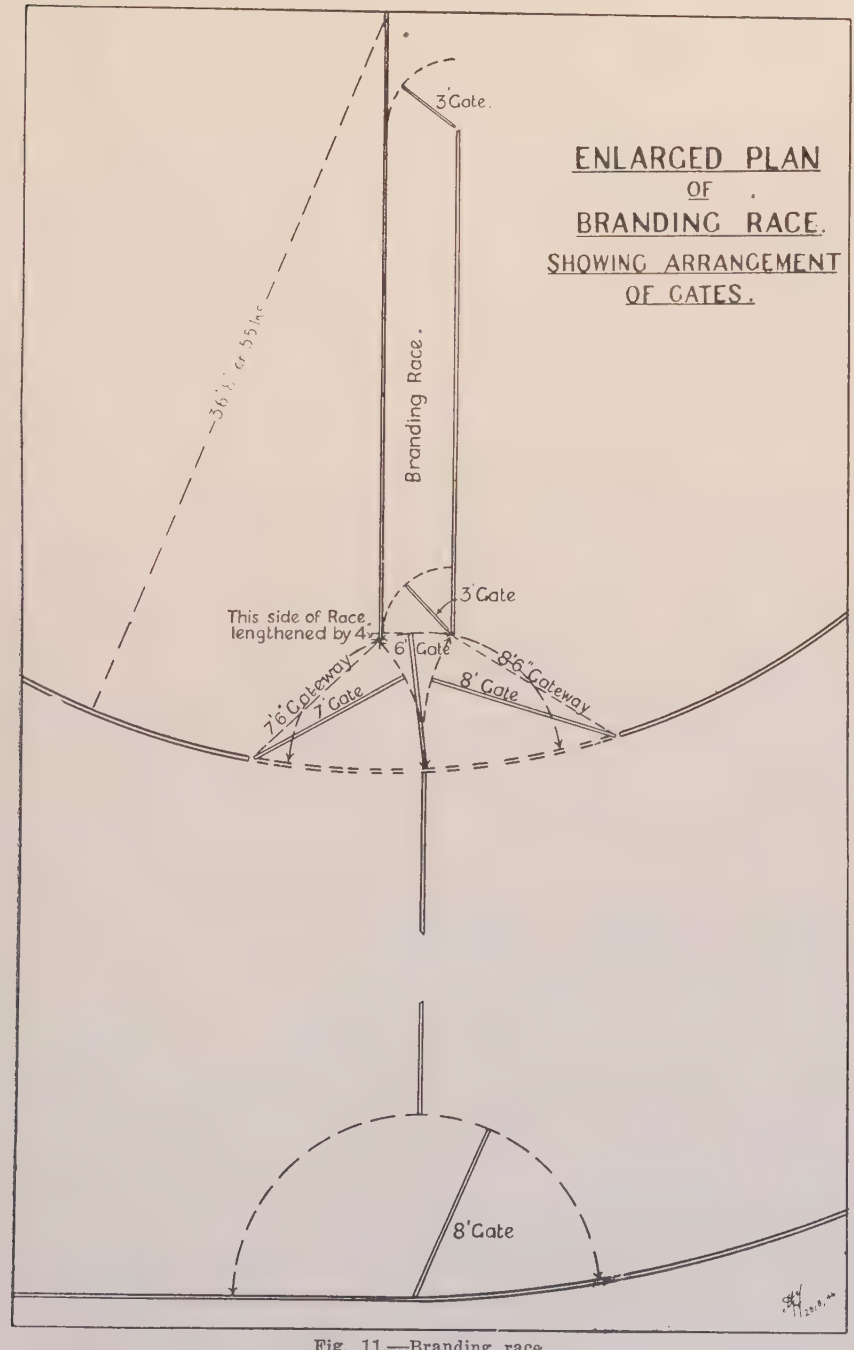
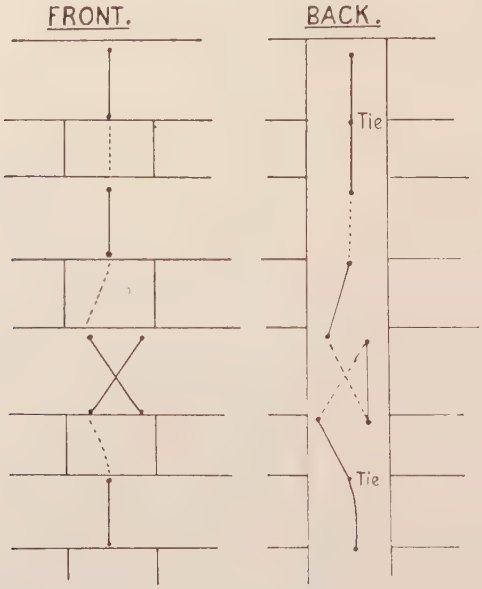



Fig. 11.—Branding race.




DETAILS of PANELS.

ABOVE:- Method of lacing on boards.

BELOW:- Spacing of boards.

WIDTH of PANELS = 6 feet.

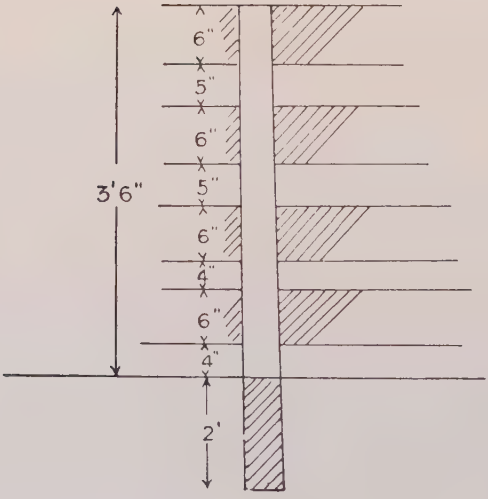



Fig. 12.—Details of sawn timber panels.

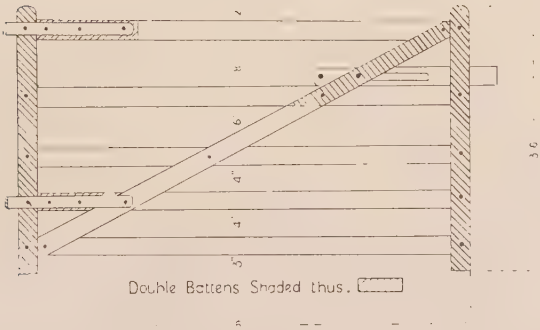



Fig. 13.
Six foot gate.

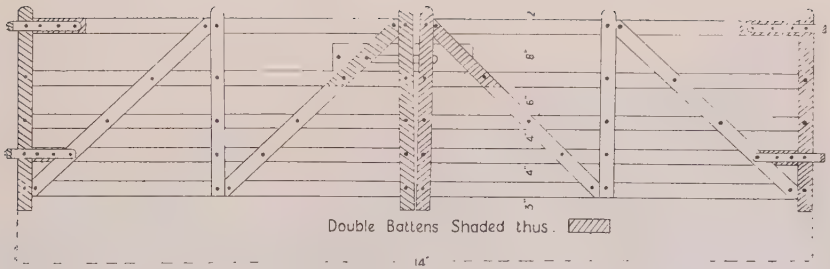



Fig. 13.
Pair seven foot gates (note gap between gates at top).

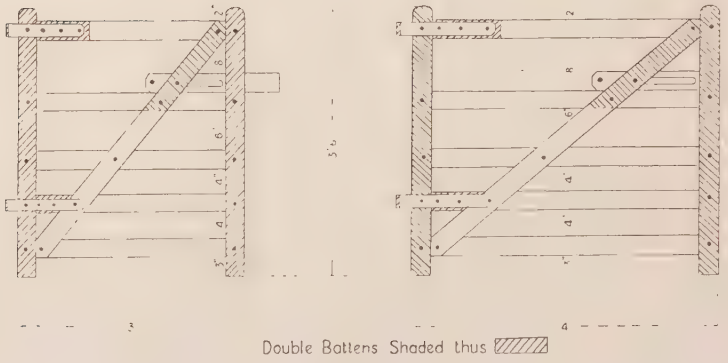



Fig. 13.
Three foot and four foot gates.

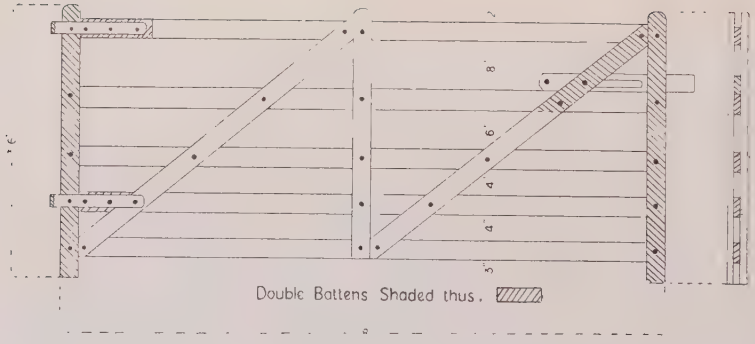



Fig. 13.
Fight foot gate.

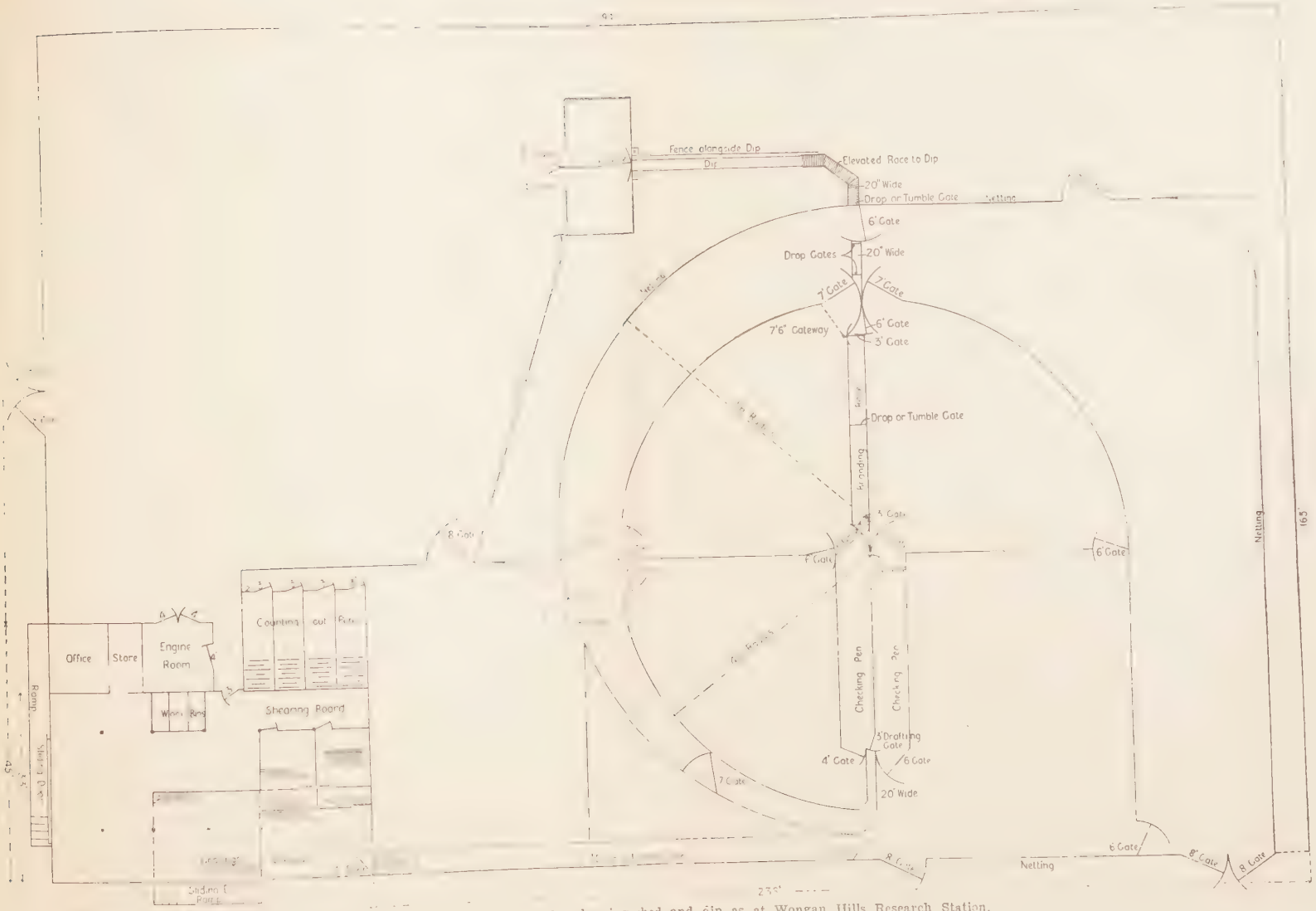



Fig. 14.—Layout of sheep yards, shearing shed and dip as at Wongan Hills Research Station.

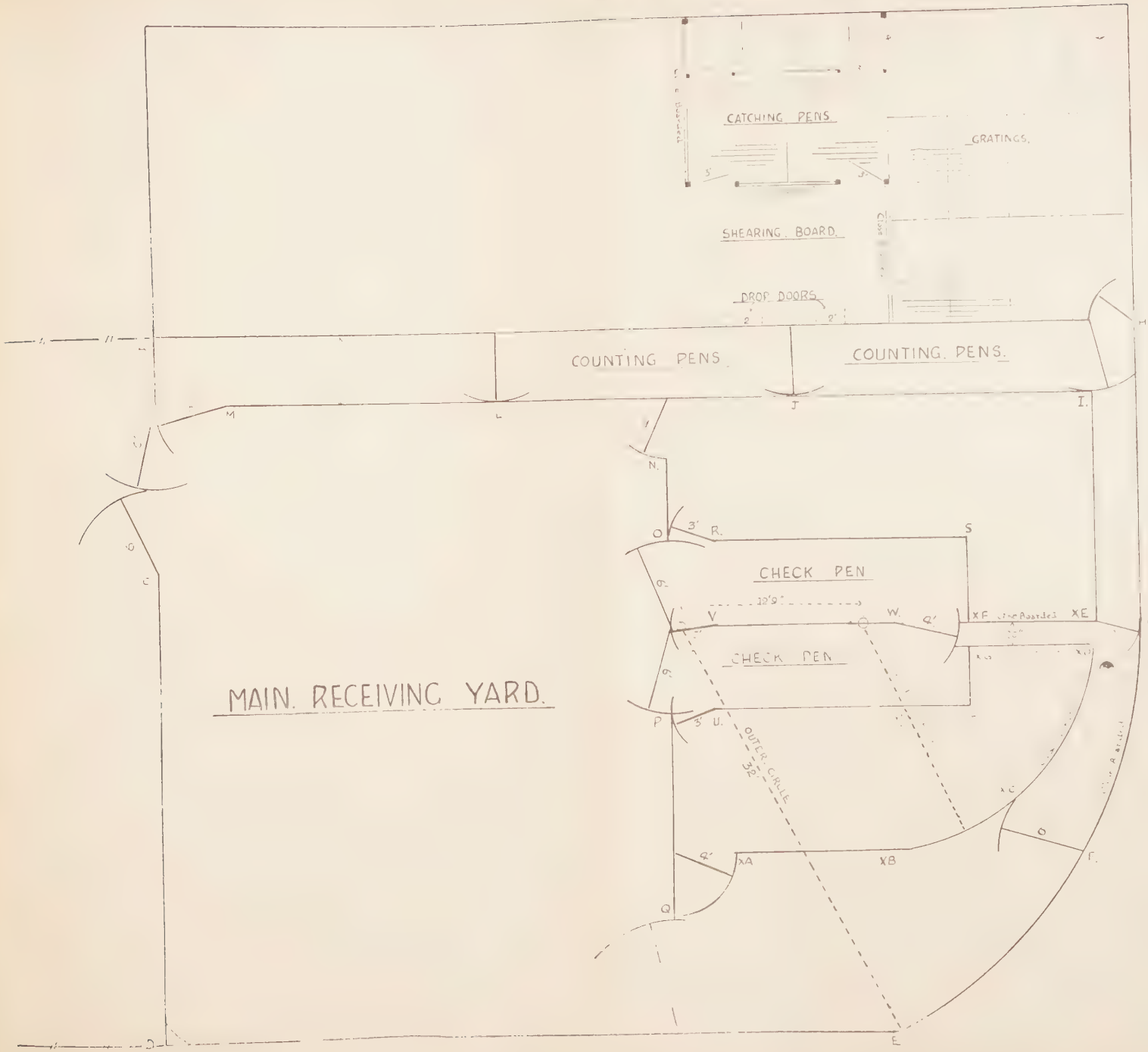



Fig. 15.—Layout of sheep yards and shearing shed as at Salmon Gums Research Station.

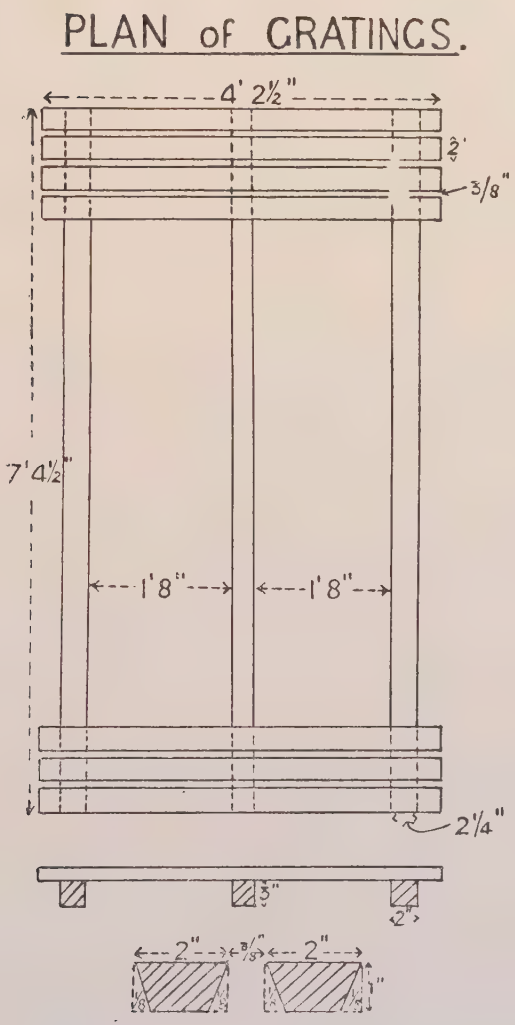



Fig. 16.—Plan of one section of gratings as used at Salmon Gums Research Station.

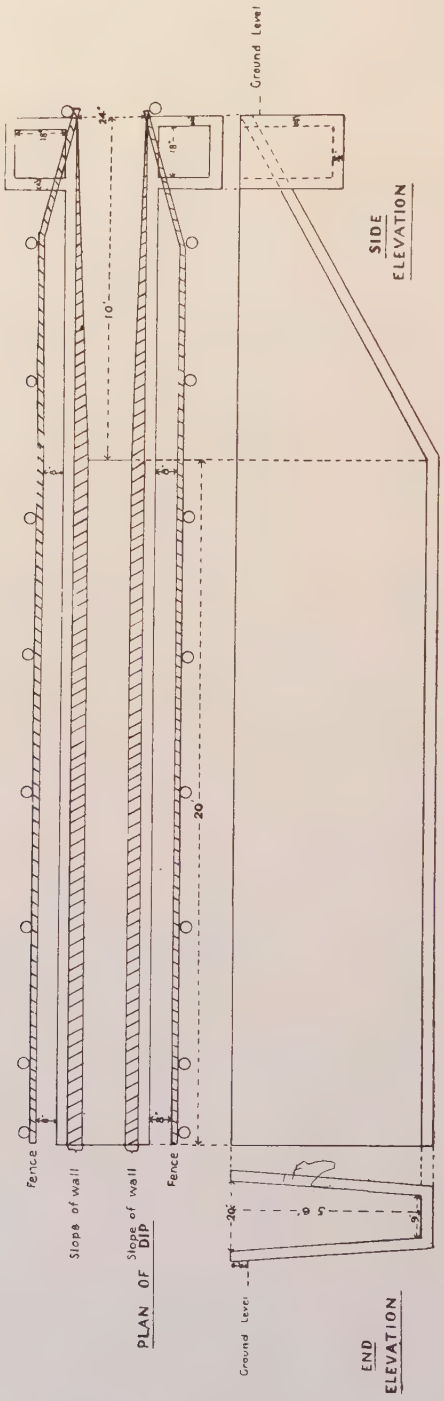



Fig. 17.—Plan of sheep dip.

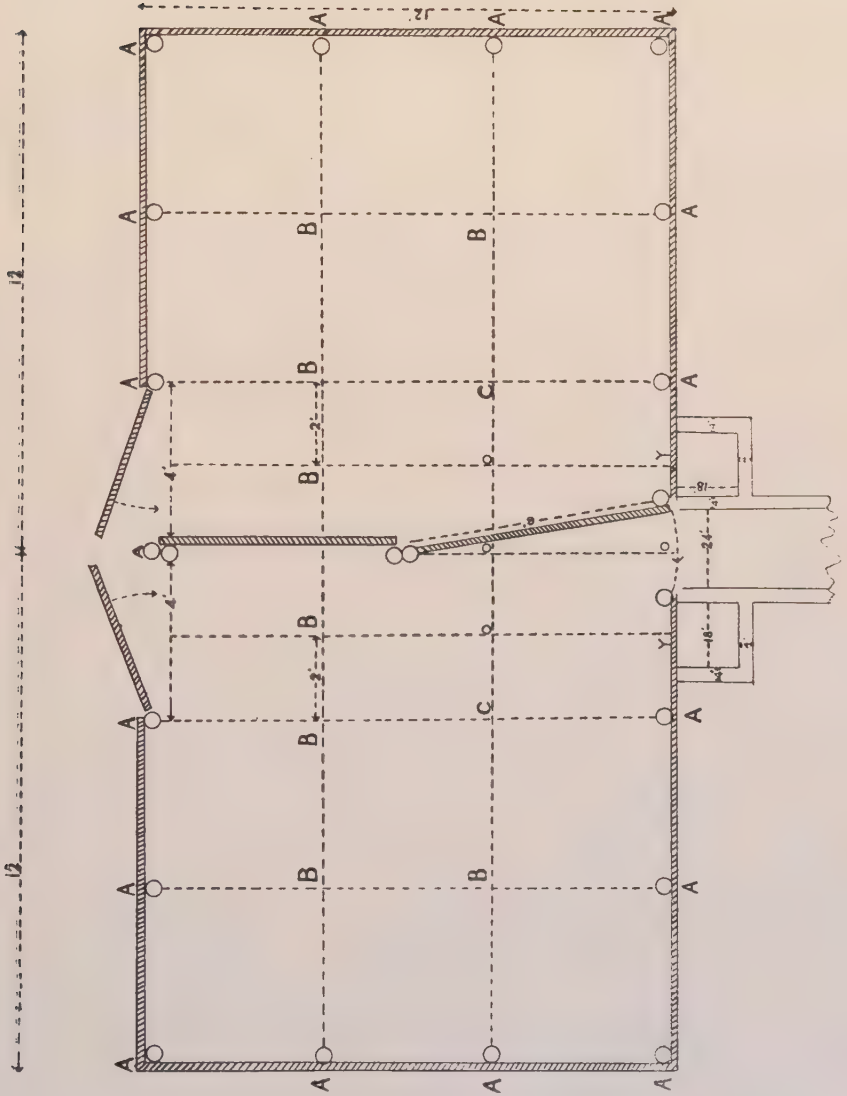



Fig. 18.—Plan of draining pens for sheep dip.

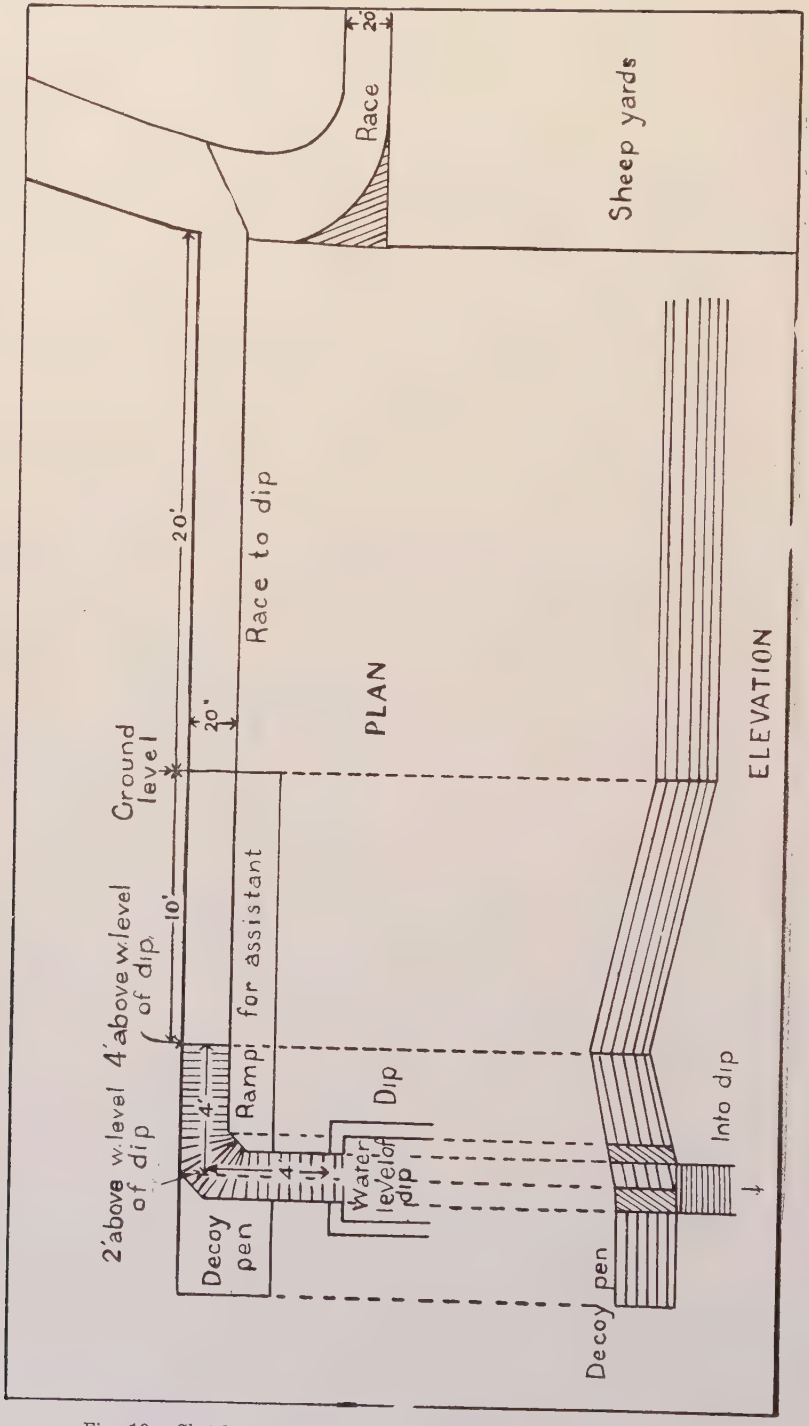



Fig. 19.—Sketch showing posit' of dip relative to sheep yards.

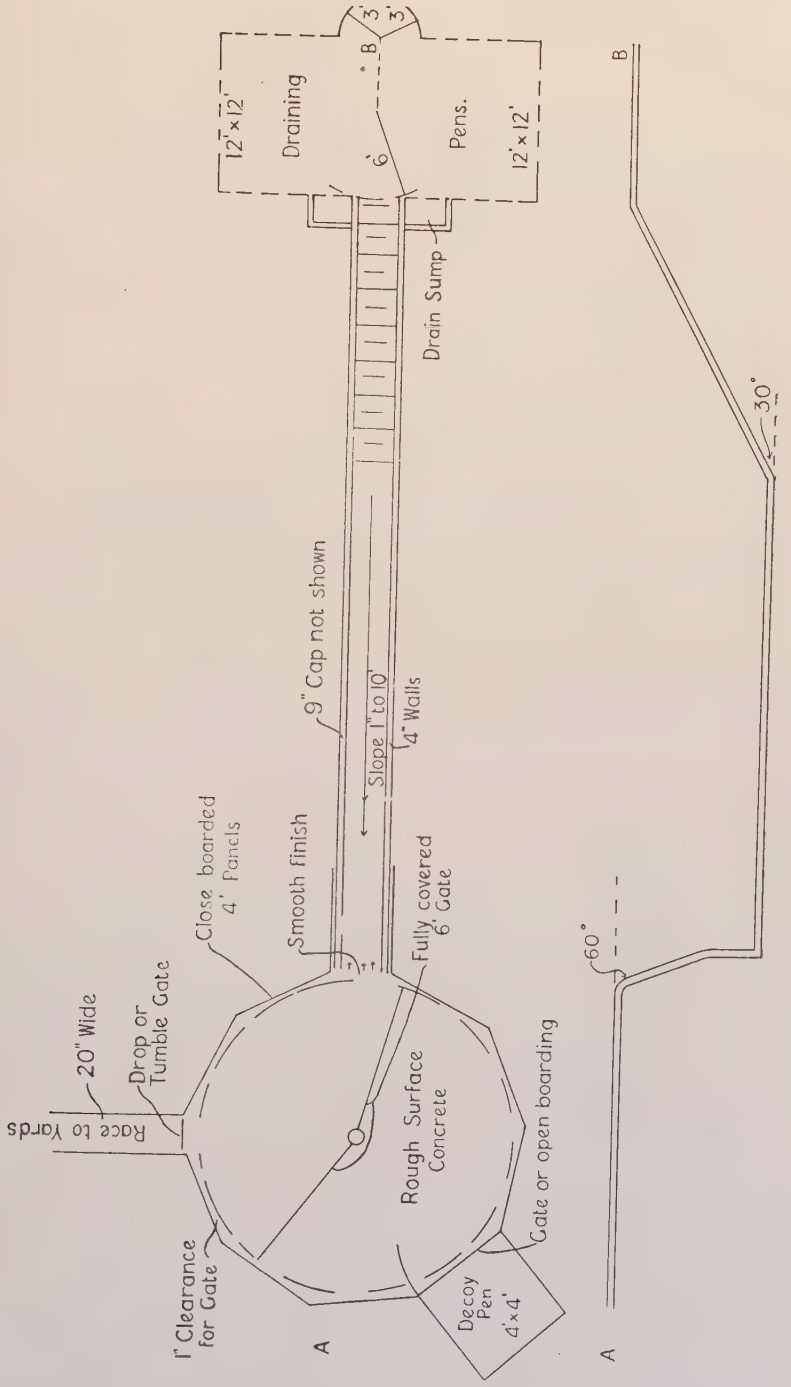



Fig. 20.—Sketch showing layout of dip with circular catching pen.

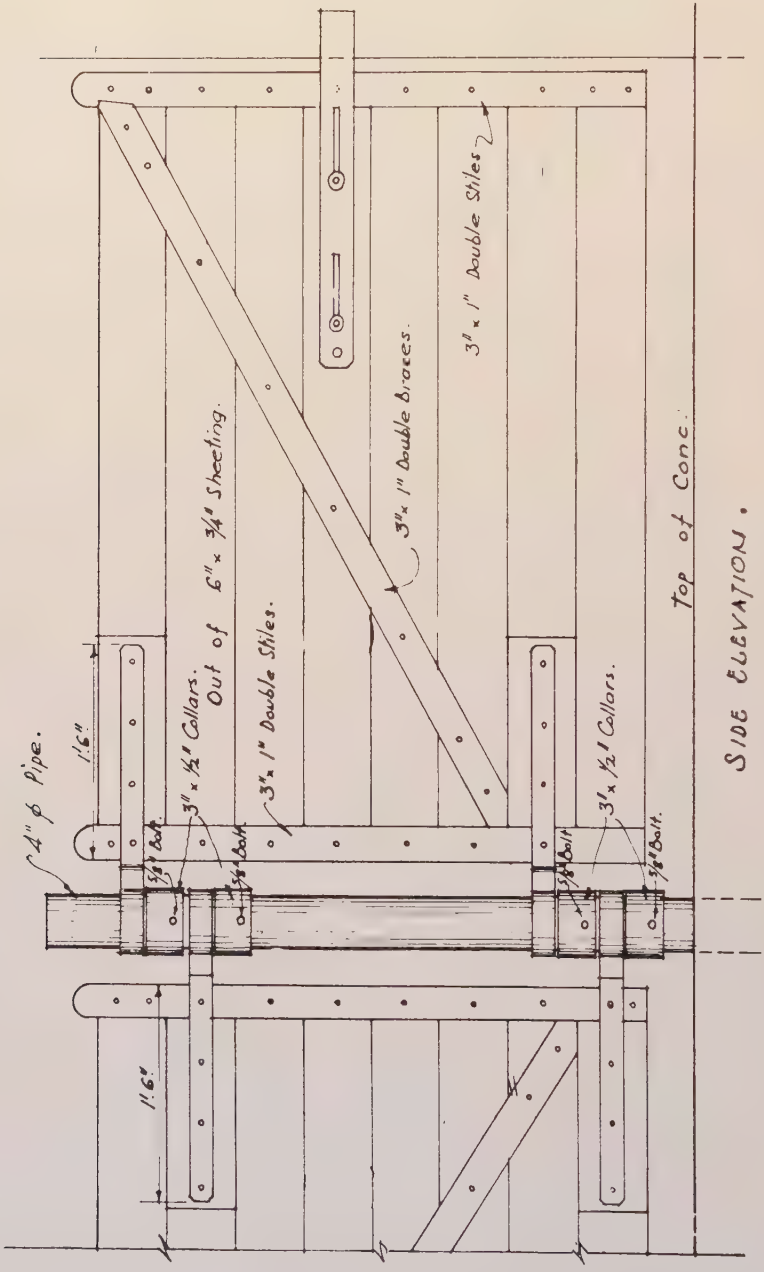



Fig. 21.—Sketch showing design and method of swinging gates in circular catching pen.

# Auto Sexing in Poultry.

A. J. MILLINGTON.

PARTICULARLY in strains of fowls developed for high egg production, the value of the female chicks is many times that of the males. Consequently it is usually desirable to be able to separate the sexes as soon after hatching as possible.

In addition to the Japanese methods used by the professional chick sexers it is possible to obtain a high degree of efficiency by using certain inherited traits which express themselves very early in the chick's life. Seven traits

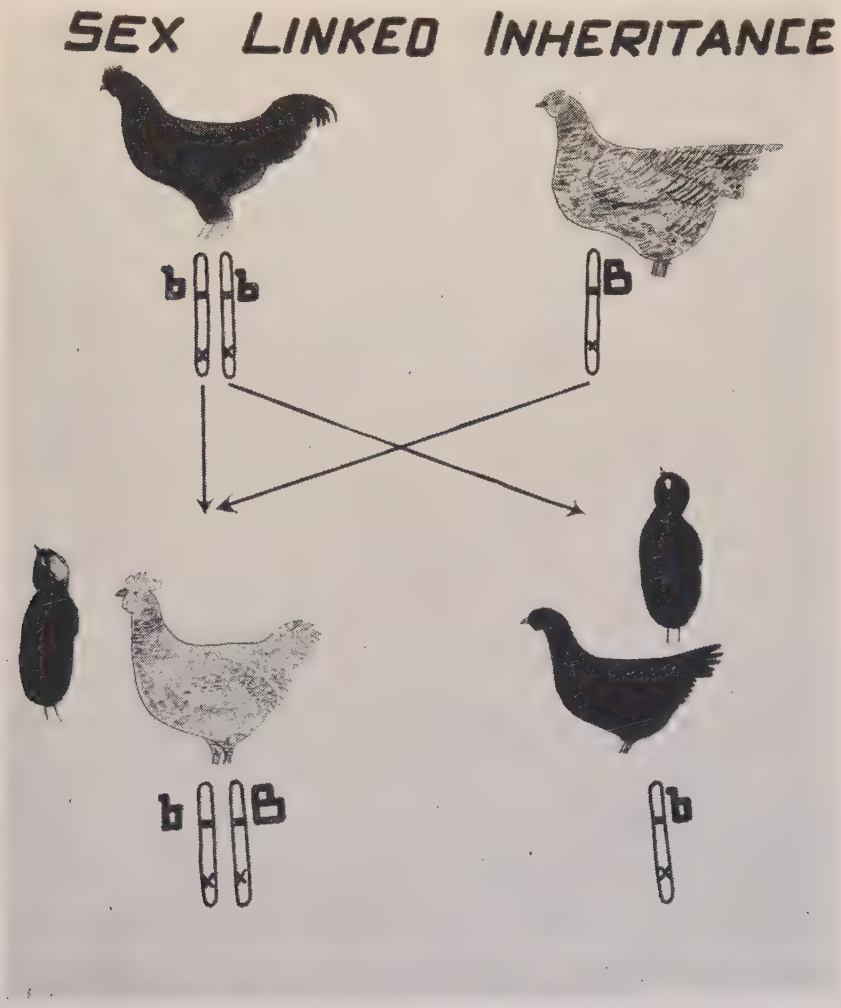



Fig. .1—The dominant gene B, for barring, causes a lighter coloured down to appear on black chicks carrying it.

are termed sex-linked because their inheritance is associated with sex and six of them can be used to differentiate the males and females at hatching. The trait which is used most extensively is the feather barring exhibited by such breeds as the Plymouth Rock.

Although from the viewpoint of inheritance, the genes are the fundamental unit, in practice they are not transmitted independently of one another. The genes are united in blocks by a thread similar to silk in composition and in inheritance those attached to the same thread or "chromosome" are inherited together.

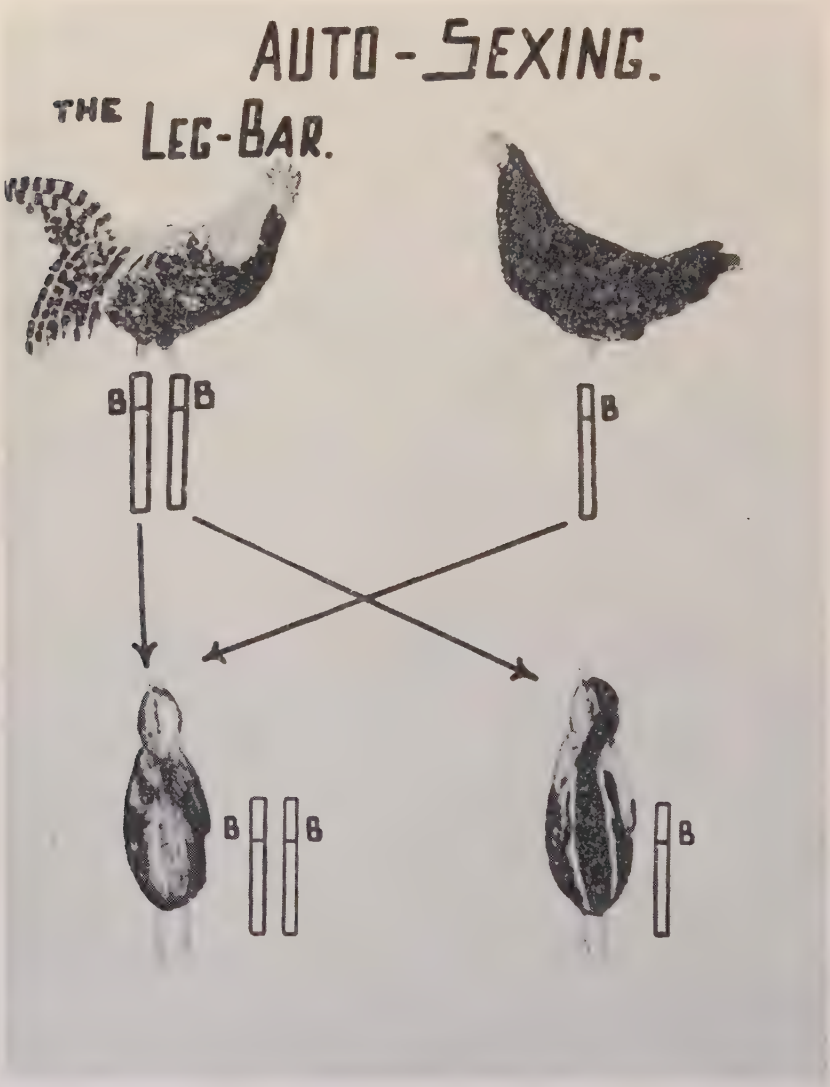



Fig. 2.—The dominant gene for barring, B, has an additive effect in lightening the down colour of chicks. The male chick having two genes for barring will be lighter in colour.

Sex is determined by genes located on the so called X-chromosome. In poultry the male possesses two X-chromosomes and the female one. The X-chromosome carries the genes such as Barring used in auto-sexing so that the males can have two, but the female only one gene for barring.

If a Rhode Island rooster and a Plymouth Rock hen are mated, one half of the chicks will have light spots on their heads and these will develop into males. The uniformly dark chicks are the pullets. This mating is shown schematically in fig. I. The reciprocal cross, Plymouth Rock male by a Rhode Island hen gives only chicks with light spots on their heads and sex differentiations cannot be made.

The auto-sexing in this instance applies only to the first generation of the cross between these breeds and, therefore, has very limited commercial application.

Consequently the development by Punnett and Pease of such breeds as the Legbar are of great interest to poultry breeders. This breed is derived, as the name implies, from a cross between a Canadian Barred Plymouth and a Danish strain of Brown Leghorns. The gene for Barring has an additive effect in lightening the typical down colour of the Brown Leghorn chick. As the male will have two and the female one gene Barring the former will be much lighter in colour than the latter at hatching. This is shown diagrammatically in fig. II.

There is considerable variation in the down colour of the chicks of the Legbar breed and selection should be made at hatching to retain the darker types which give a much better differentiation of the sexes.

# Progeny Testing of Poultry.

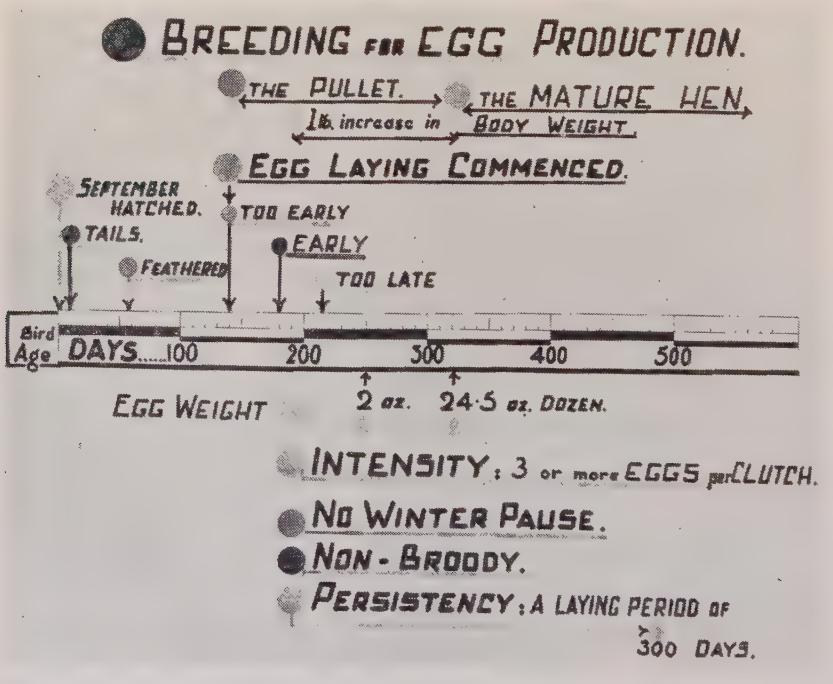
A. J. MILLINGTON, Geneticist.
E. LOVEGROVE, Poultry Adviser.

THE great fecundity and early maturity of the domestic fowl enable the breeder who is able to apply modern methods to make very rapid progress in raising the average level of egg production. American flocks have been developed in which a production of 240 eggs per bird each year is achieved with absolutely no culling, and this result was made possible by the adoption of progeny testing. Although the productivity of a hen is easily measured and expressed in terms of her egg production, the merit of the male can be assessed only indirectly. Thus by comparing the productivity of his daughters with that of their mothers, it is possible to measure the capacity of a male to transmit the heredity necessary for high production. American data indicates that slightly less than 10 per cent. of roosters used for breeding purposes are capable of raising the level of production. Genetic considerations imply that such birds must carry most of the heredity for high egg laying in a fairly pure condition and by using only proven males, the level of production can be materially and permanently raised.

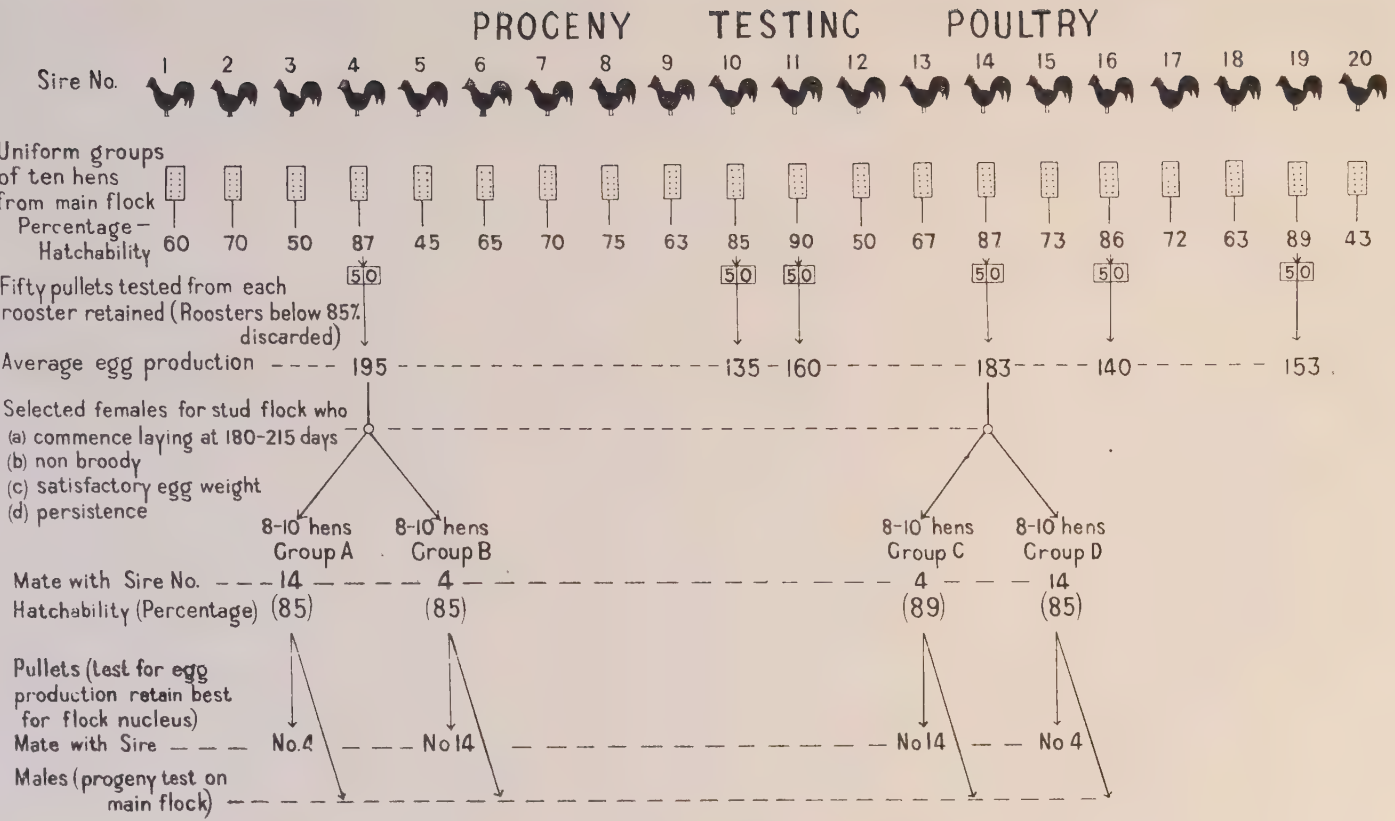
For each progeny-tested sire which the breeder requires, about 10-12 cockerels should be tested. If more birds can be tested, the progress is likely to be very rapid. Superior progeny-tested males should be used as long as they live.

Only young roosters should be progeny-tested since the trial occupies about eighteen months and proven birds will be at least 2½ years old. Each male to be tested, should be mated with a group of 8-10 average hens and it is important that the groups are about equal in respect to egg laying capacity, so that high producers are not mated to one sire and low to another. Males with low hatchability will be discarded. About 50 pullets should be raised from each male tested for egg laying, and it is essential that no culling within groups should be practised, but deaths, deformities and hatchability should be recorded. The housing and feeding of the various pens should be as alike as possible. For September hatched pullets, laying should commence when they are 180-210 days old. Birds commencing before or after this period should be banded for subsequent discard, as should all pullets showing broodiness. Persistency is the most important single characteristic and hens which lay for over 300 days without moulting should be excellent foundation birds, for mating with progeny-tested sires. They should be trapnested to give information on egg size etc. The above data will be considered for each rooster together with the average egg production of ALL his daughters.

The best manner in which to use the rooster, once his merit has been proven, will vary with circumstances. The effects of intense inbreeding on hatchability, etc, should be ascertained, but in general, proven roosters are best used in pairs. Each is mated with the selected daughters of the other and then with his grand-daughters so produced. However, it is not possible to forecast what the effects of inbreeding will be so limited matings of each proven male with his own daughters should be tried.




The high-producing hen has the characteristics: early maturity, high egg intensity, no winter pause, non-broody and delaying period of three hundred or more days without a moult.


PROGENY TESTING POULTRY
Sire No. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Uniform groups of ten hens from main flock
Percentage — Hatchability 60 70 50 87 45 65 70 75 63 85 90 50 67 87 73 86 72 63 89 43
Fifty pullets tested from each rooster retained (Roosters below 85% discarded)
50
Average egg production 195 135 160 183 140 153
Selected females for stud flock who
(a) commence laying at 180–215 days
(b) non broody
(c) satisfactory egg weight
(d) persistence
8-10 hens Group A
8-10 hens Group B
8-10 hens Group C
8-10 hens Group D
Mate with Sire No. 14 4 4 14
Hatchability (Percentage) (85) (85) (89) (85)
Pullets (test for egg production retain best for flock nucleus)
Mate with Sire No. 4 No 14 No 14 No 4
Males (progeny test on main flock)

Progeny testing is capable of lifting production rapidly to a fairly high level, probably to the vicinity of 200 eggs per bird each year. Thereafter, it is desirable to supplement it with data on the five characteristics which control fecundity in the domestic fowl, since it is possible that all five are not present in the strain. In this respect the poultry breeder is extremely fortunate inasmuch as in no other domestic animal is the inheritance of commercial production so well understood.

Fig. I sets out schematically the characteristics of the high producing hen. Many of them can be ascertained only with the aid of trapnesting. When selecting hens for the stud flock, trapnesting for a few days will yield important data on egg size and if this is not satisfactory, the birds can be banded for discard.

The programme set out schematically in Fig. II envizages the maintenance firstly of a stud or nucleus flock of females derived from and mated only with birds which have given a satisfactory progeny test and secondly a main flock to supply females for progeny testing males from the stud group.

The stud flock will comprise four or so families and in general best results will probably follow the use of progeny-tested males from one group on selected females of the other.

The surplus stock from the stud group will pass into the main flock and gradually improve it.

Details of suitable record forms and further details may be obtained from "Poultry Breeding Applied" by Hayes and Klein or from the Department of Agriculture, Perth.

The authors would like to thank Mr. A. M. Stewart of the Institute of Agriculture and Mr. R. Harrison for their helpful discussions.

*SUMMARY*: The important points to note in progeny testing poultry are:—

(1) The groups of females used for matings to progeny test roosters should be as uniform as possible and of average merit.

(2) As many males as possible should be tested and heavy culling for hatchability will reduce the number to be carried through for egg production tests. Hatchability should be 85 per cent. or better.

(3) In progeny testing the performance of ALL the daughters must be included.

(4) The two best sires should be retained for mating with the best daughters of the other to provide males for further progeny testing. The effects of inbreeding, i.e. Father-daughter or brother-sister matings should be ascertained.

(5) The best daughters of the best roosters will be used only in matings with males which have given satisfactory results in progeny tests. Progeny-tested males should be used for as long as they live.

# Flax Seed Treatment.

W. P. Cass Smith, Plant Pathologist.
H. L. Harvey, Assistant Plant Pathologist.

## INTRODUCTION.

THE treatment of agricultural seeds with fungicides is widely practised as a means of controlling losses due to disease-causing organisms carried by the seed or in the soil. Flax seed (or linseed) is no exception and seed treatments are now recommended and used in a number of countries where trouble of this nature is anticipated.

In Western Australia flax growing on a commercial scale was first attempted in 1940 and seed for that year's crop had to be imported from England. By arrangement with the Commonwealth Flax Production Committee who assumed control of the flax growing in Australia during the war years, the seed was dusted with ceresan UT 1875 A, before distribution to growers as a precaution against seed-borne diseases, and possibly damping-off losses also.

Yearly since that time practically all flax seed sown in Western Australia has been ceresan treated, and dusted seed has also been sown in certain years in the other flax growing States of the Commonwealth.

Subsequently, the Flax Production Committee considered that, as the incidence of seed-borne diseases appeared to be low, and seed "pickling" involved both extra expense and certain practical difficulties also, the practice was of very doubtful value.

Pathologists in all flax growing States were therefore requested to express their views on the matter. This department, while sympathising with the Flax Production Committee's desire to avoid unnecessary expenditure, advocated the continuance of seed "pickling" at least until its value had been disproved by experiment. Although the incidence of such seed-borne diseases as seedling blight (*Colletotrichum lini*) had proved to be low, it was considered that this might be due in part to the applied seed treatment. It was also thought that the sowing of untreated seed might result in losses from damping-off, a disease which has been reported from many different localities in Western Australia. Damping-off is caused by soil inhabiting fungi, which attack the germinating seeds, and destroy the young seedlings either before or just after they emerge above ground, leaving the grower in many cases with the firm conviction that he has been sold a poorly germinating line of seed.

At the request of the Flax Production Committee, therefore, the following experiments were carried out "in order to discover whether seed 'pickling' was of any definite benefit."

## EXPERIMENTS.

*Materials.*

The seed used in these experiments was drawn from a commercial line of Concurrent imported from Victoria. This is the main variety grown in Western Australia. Most of the seed for the current season's crop had already been "pickled" with ceresan UT 1875 A at the rate of 2 ozs. per bushel, and this was one of the few "unpickled" lines available at that time. It was finally selected on the recommendation of the Flax Liaison Officer (Mr. H. G. Elliott) as being a

good average sample. The balance of this line was supplied to commercial growers for planting during the same season. Subsequent microscopic examination showed that there was little or no cracked or broken seed, while a seed test by the Ulster method (1) yielded no trace of *Colletotrichum lini* and only one colony of *Polyspora lini* per hundred seeds. In laboratory tests the sample showed 84 per cent. germination on blotting-paper pads.

The fungicides used and the rates of application are set out in Table 1.

TABLE 1.

SEED TREATMENTS.

| Treatment No. | Fungicide. | Rate. |
|---|---|---|
| 1 | Ceresan U. 564 (8 per cent. Solution) | 1 gallon per cwt. |
| 2 | Nomersan RD. 7846 ... ... | †2 ozs. per bushel. |
| 3 | Agrosan ... ... ... ... | 2 ozs. per bushel. |
| 4 | Control (Untreated) | |
| 5 | Ceresan UT. 1875 A. ... ... | 2 ozs. per bushel. |
| 6 | Tetroc (Spergon)* ... ... ... | 2 ozs. per bushel. |

* Tetrachloro-para-benzoquinone.
† Maker's recommendation is 8 ozs. per bushel.

The dusts were applied at the uniform rate of 2 oz. per bushel, as this dosage was considered sufficient to compare their effectiveness as protectants against damping-off, and it was similar to that applied during the current season to commercial flax seed before distribution to growers.

Laboratory tests showed that germination of the seed was unaffected by any of the treatments.

*Method.*

It was originally planned to use both small hand-sown plots and large scale drill-sown plots, the latter having drill strips as plot units and both having a randomised block design with eight replications. The drill sown experiments, however, were abandoned because of the number of variable factors which would detract from the precision of the work. These factors include:—

1. Rate of flow through the drill of the seeds subjected to different treatments which in preliminary trials varied up to 12½ per cent.

2. Variation in rate of flow between the different drill tubes.

3. Intermittent blockages of drill tubes.

4. Extreme variation of depth of sowing which would be accentuated by the extremely wet condition of the soil.

These and other factors contributed to the failure of the drill-sown experiments in the previous year.

The hand-sown experiments were arranged as randomised blocks each having eight replications of six treatments. Each treatment row measured five links and contained 330 seeds, calculated to be equivalent to 72 lb. per acre, and rows were spaced one link apart. Super. was first applied to the rows at the rate of one

(1) Muskett and Malone, 1941. The Ulster Method for the Examination of Flax Seed for the Presence of Seed-borne Parasites. Ann. App. Biol., 28; pp. 8-13.

and a half cwt. per acre. Rates of sowing and fertiliser and the row spacing were made to simulate field conditions. Sowing was at a uniform depth of half an inch.

Uniform plantings of the experiment were made between the 12th and 16th of June, 1945, at five different sites in the flax growing areas, viz., Wokalup State Farm, Donnybrook, Boyup Brook, Bridgetown and Muradup and a sixth planting was made at the Institute of Agriculture, University of W.A., Perth. With the exception of the University site, all sites were selected at random in well separated centres in the flax belt and were located in paddocks where commercial flax crops were being grown that year. The rainfall throughout the South-West of Western Australia during the growing period was heavier than it had been for many years with the result that surface wash damaged the plantings wholly or in part at all sites except Bridgetown. Second plantings were necessitated at Wokalup and Donnybrook and these were made on the 17th and 18th of July. At Muradup the experiment was abandoned, as further land for a second planting was not available.

The soil types at the experiment sites are as follows:—

Wokalup—brown to chocolate medium-heavy loam.
Donnybrook—red to chocolate medium loam.
Boyup Brook—grey gritty sandy loam.
Bridgetown—medium chocolate loam.
Muradup—gritty, gravelly loam.
University of W.A.—grey coastal sand.

*Results.*

(a) *Counts at Early Seedling Stage.*—Emergence counts were commenced on the 18th July, five weeks after planting and although the Donnybrook experiment had been partially destroyed by rain wash, three of the eight blocks were undamaged and were therefore included. The counts were taken in the middle 3½ links only (231 seeds) thus leaving a sown buffer at either end of each plot.

The counts on the late planted plots at Donnybrook and Wokalup were also made five weeks after planting, viz., 13th August, and again at Donnybrook two blocks were so badly damaged by heavy rain and surface wash that they were excluded. The mean emergence counts stated as percentages are presented in Table 2. Plants averaged from one inch to 1½ inches in height when the counts were taken.

TABLE 2.

COUNTS AT SEEDLING STAGE—MEAN PERCENTAGE EMERGENCE.

| Treatment. | Donny-brook (1st Planting). | Donny-brook (2nd Planting). | Bridge-town. | Boyup Brook. | Uni-versity. | Wokalup. |
|---|---|---|---|---|---|---|
| | 3 blocks. | 6 blocks. | 8 blocks. | 7 blocks. | 7 blocks. | 8 blocks. |
| 1 ... ... ... | 49·6 | 51·6 | 56·9 | 54·2 | 48·4 | 52·7 |
| 2 ... ... ... | 33·5 | 54·0 | 57·6 | 55·4 | 53·1 | 53·1 |
| 3 ... ... ... | 24·4 | 48·2 | 48·2 | 40·9 | 36·1 | 42·0 |
| 4 ... ... ... | 17·0 | 40·8 | 45·2 | 29·6 | 35·2 | 36·6 |
| 5 ... ... ... | 53·1 | 60·9 | 68·4 | 62·6 | 58·5 | 61·1 |
| 6 ... ... ... | 46·9 | 65·9 | 64·0 | 55·5 | 56·0 | 61·7 |
| Difference for significance at 1 per cent. level ... ... | 25·61 | 12·68 | 7·84 | 9·28 | 14·44 | 9·65 |

It will be seen from Table 2 that seed treatment with ceresan and tetroc significantly increased the emergence at all six sites, ceresan wet and nomersan at five sites and agrosan at only one site.

To give a picture of the results from all sites as a whole at the early seedling stage the mean results from the 39 blocks are presented in Table 3.

TABLE 3.

MEAN PERCENTAGE EMERGENCE FROM ALL SITES (39 BLOCKS).

| Treatment. | Percentage Emergence. |
|---|---|
| 1. Ceresan U. 564 (wet) ... ... ... ... ... ... | 52·6 |
| 2. Nomersan ... ... ... ... ... ... ... ... | 53·1 |
| 3. Agrosan ... ... ... ... ... ... ... ... | 41·8 |
| 4. Control (Untreated) ... ... ... ... ... | 36·0 |
| 5. Ceresan UT. 1875 A. ... ... ... ... ... ... | 61·8 |
| 6. Tetroc ... ... ... ... ... ... ... ... | 59·5 |
| Difference for significance at 1 per cent. level ... ... ... | 4·55 |

The improvement in emergence due to the use of ceresan and tetroc is highly significant when compared with untreated seed. The remaining treatments while producing significant increases were not as effective as ceresan and tetroc.

(b) *Counts at Flowering Stage.*—To ascertain whether the differences in plant numbers at the emergence stage due to seed treatment were still reflected later, plant stand counts were also made at the flowering stage, commencing on the 8th of October. The experiments at the University and at Donnybrook (first planting) were not included in these counts, because the former was located in a non-commercial area, and growth after emergence, was unthrifty, and the latter was upset by further rain wash. The results are shown in Table 4.

TABLE 4.

COUNTS AT FLOWERING STAGE—MEAN PERCENTAGE PLANT STAND.

| Treatment. | Wokalup. 8 blocks. | Donnybrook. 6 blocks. | Boyup Brook. 7 blocks. | Bridgetown. 8 blocks. |
|---|---|---|---|---|
| 1 ... ... ... | 52·6 | 41·3 | 18·9 | 53·1 |
| 2 ... ... ... | 51·2 | 46·4 | 25·7 | 51·5 |
| 3 ... ... ... | 42·5 | 42·0 | 19·3 | 41·8 |
| 4 ... ... ... | 35·1 | 34·6 | 14·7 | 42·3 |
| 5 ... ... ... | 63·3 | 52·0 | 26·2 | 59·6 |
| 6 ... ... ... | 61·8 | 56·0 | 23·8 | 54·7 |
| Difference for significance at 1 per cent. level | 1·04 | 14·85 | No difference in treatments | 10·16 |

Compared with plant numbers at the emergence stage, a general reduction in plant stand was noticed which was apparently due to heavy weed growth. At Boyup Brook weed competition was so great that the stand was very sparse, and differences were not significant. However, significant differences occurred at all

d

the remaining sites. Observations made during growth and at the flowering stage revealed that the only disease present of any consequence was rust (*Melampsora lini*) which developed more or less uniformly throughout the plots.

As was done with the emergence counts, counts taken at the flowering stage were grouped to give a picture of the average plant stand from all sites.

Table 5 presents the mean percentage plant stand from all 29 blocks in four different localities.

TABLE 5.

MEAN PERCENTAGE PLANT STAND FROM ALL SITES AT FLOWERING STAGE (29 BLOCKS).

| Treatment. | Percentage Plant Stand. |
|---|---|
| 1. Ceresan U. 564 (wet) ... ... ... ... ... ... | 41·8 |
| 2. Nomersan ... ... ... ... ... ... ... ... | 44·1 |
| 3. Agrosan ... ... ... ... ... ... ... ... | 36·6 |
| 4. Control (Untreated) ... ... ... ... ... ... | 32·0 |
| 5. Ceresan UT. 1875 A. ... ... ... ... ... ... | 51·0 |
| 6. Tetroc ... ... ... ... ... ... ... ... | 49·5 |
| Difference for significance at 1 per cent. level ... ... ... | 5·63 |

It will be noted that significant differences in plant numbers at the emergence stage due to seed treatment are still maintained at flowering time, with the exception of the agrosan treatment.

The differences in mean plant stand closely follow the same trend as the mean emergence differences while the stands resulting from the use of ceresan UT 1875 A and tetroc are better than the remainder.

*The Organisms Associated with the Losses from Damping-off.*

An examination of the plots at an early stage of growth indicated that a majority of affected seedlings had been destroyed by damping-off before emergence through the soil.

A number of rotted seeds and young seedlings were obtained from the control rows, and isolations from these yielded fairly consistently *Pythium* spp. and *Phytophthora* sp. Soil isolations from the same places yielded predominantly *Pythium* sp. and *Fusarium* sp.

Species of both Pythium (2) and Phytophthora have previously been recorded in other countries as causing a damping-off of flax and both are commonly occurring soil inhabitants.

## DISCUSSION.

Under the conditions of these experiments, the treatment of flax seed with fungicides reduced losses from damping-off, thereby producing better stands.

Uniform experiments in several well separated localities showed that increased plant numbers were obtained at the emergence stage from all five seed treatments, and at the flowering stage from all treatments except agrosan.

Sowings of 100 seeds of variety Concurrent per foot of row (84 of which were germinable) yielded an average of 36 seedlings at the emergence stage, from untreated seed, compared with 62 and 60 from seeds treated respectively at 2 ozs. per bushel with ceresan UT 1875 A and tetroc (spergon), the two most effective fungicides. (See Table 3.)

(2) Millikan, C. R., 1945. "Damping-off" Disease of Flax. *Jour. Dept. Agric., Vic.* 43, 177-181.

(b)

At the flowering stage, an average stand of 32 plants per foot of row had survived from the untreated seed, compared with 51 and 50 from the ceresan and tetroc treated seed, which maintained their superiority over other treatments. (See Table 5.)

It is thus obvious that under conditions when damping-off occurs a more effective utilisation of the seed, and uniformly better stands can be ensured by "pickling." These benefits may in the final analysis more than offset the cost of "pickling."

The occurrence of damping-off is influenced by seed quality, soil and climatic factors. Poor seed samples, containing much cracked or broken seed, are particularly liable to attack, but samples, apparently of good average quality may also be affected, as happened in these experiments.

The occurrence of seasonal and soil conditions conducive to damping-off cannot be accurately forecasted. However, the disease may develop under widely varying conditions, for in these experiments when it developed at all sites, very wet conditions were experienced, whereas in Victoria damping-off was also reported under dry conditions (2).

It is also of interest to note that ceresan UT 1875 A which proved to be one of the two most effective dusts in these experiments, has been generally used in Western Australia for pickling flax seed supplied to commercial growers, and that it is less costly than tetroc (spergon) which is equally effective.

ACKNOWLEDGMENTS.

The authors are indebted to the Flax Production Committee for financial assistance which enabled these experiments to be carried out. They also gratefully acknowledge assistance received from the Conservator of Forests, Mr. T. N. Stoate, in connection with the statistical analysis of the results, and the helpful co-operation of a number of departmental officers, and the following growers, on whose properties the experiments were planted:—Messrs. J. Mitchell, Donnybrook; Brooks and Dent, Boyup Brook; F. Hill and H. Haggerty, Muradup; and M. Scott, Bridgetown.

# Acetonaemia (Acidosis, Ketosis) in the Dairy Cow.

C. R. TOOP, Senior Veterinary Surgeon.

ALTHOUGH the disease acetonaemia occurs quite frequently in dairy cows it is rarely recognised as such by the dairy farmer. A considerable number of cases of the disease have been encountered in the field and many others have been reported in which the description furnished has left little doubt concerning the identity of the condition. The available information suggests that the incidence of the disease has increased during recent years. For the most part acetonaemia occurs during the first six weeks of lactation and is characterised by loss of appetite, marked reduction of milk yield, rapid loss

of condition, listlessness and constipation and at times by the presence of a peculiar sweetish odour which may be detected in the breath, milk and urine. In some cases there are nervous complications.

The mortality rate is low and recovery is the rule. Since the disease occurs during early lactation when it greatly depresses the milk flow it may become a source of considerable loss. The majority of cases respond promptly to appropriate treatment.

## CAUSE.

The actual cause of the disease has not been determined but there is little doubt that it is a nutritional disorder. It is believed to be due to a derangement of metabolism in association with which the blood sugar falls below the normal level and abnormal amounts of toxic substances known as ketone bodies accumulate in the blood and tissue fluids. This may be due to a failure on the part of the animal to derive a sufficient amount of carbohydrate from its diet or to an inability to properly utilise the carbohydrate that is available. Carbohydrates are represented by such substances as starch, fibre and sugars and provide the principle source from which an animal derives its energy requirements. When the carbohydrate falls below the required level the animal is forced to draw upon its fat reserves. When fat is completely burned or oxidised in the body the end products are carbon dioxide and water which are excreted and cause no ill effects. For the complete combustion of fat an adequate supply of carbohydrate is necessary. When the supply of carbohydrate is inadequate the oxidation of fat cannot proceed to completion but becomes arrested at an intermediate stage wherein the fat has become converted to substances known as ketone bodies which accumulate in the blood and are excreted in the breath, milk and urine to which they impart a characteristic odour. Ketone bodies are acid in reaction and possess toxic or poisonous properties. Acetone is one of these and it is from the presence of this substance in the blood that the name acetonaemia is derived.

It has recently been claimed by American workers that acetonaemia may result from deficiency of Vitamin A and spectacular recoveries have been reported from treatment with this substance. The original findings, however, do not appear to have been borne out by subsequent observations. In Western Australia the disease occurs at all periods of the year and is probably most prevalent when green feed is abundant. Since green feed is a rich source of Vitamin A it seems unlikely that a deficiency of this Vitamin would be an important factor in relation to the occurrence of the disease in this State.

## SYMPTOMS.

Although the disease may occur at any time during the lactation period the majority of cases occur from about a week to six or eight weeks from the date of calving. Cows of any age may become affected. The condition is most frequently observed in well nourished high-producing animals. Two forms of the disease may be recognised (1) the digestive form and (2) the nervous form. The majority of cases are of the first mentioned type.

*Digestive Form.*

In the digestive form of the disease there is a sudden or gradual loss of appetite and this is accompanied by rapid loss of condition and a marked fall in the milk yield. The cow is dull and listless and a sweetish chloroform-like odour of acetone may in some cases be detected in the breath, milk and

urine. The detection of this characteristic odour may depend on the keenness of the sense of smell and while it will immediately be recognised by some observers upon entering the shed occupied by an affected cow nothing unusual will be noticed by others, The bowels are usually constipated, droppings being passed infrequently and in small amounts. Diarrhoea has been observed in some cases but this is unusual.

*Nervous Form.*

In addition to the symptoms occurring in the digestive form of the disease cows affected by acetonaemia may show a variety of nervous symptoms. In some cases there may be constant licking of the skin or licking or biting at the manger and other objects. There may be sucking of the tongue, slobbering from the mouth, grinding of the teeth, champing of the jaws and rolling of the eyes. The gait may be staggering and unsteady and the cow may have difficulty in remaining on her feet; she may fall and may remain down for some time before being able to regain her feet. Other symptoms which have been described include marked excitement with wild expression and staring eyes, violent movements, walking in circles, stringhalt and convulsions.

It should be recognised that the digestive form of the disease predominates and that a smaller proportion of cases may become complicated by one or more of the nervous symptoms above described.

## COURSE OF THE DISEASE.

The majority of cases of acetonaemia terminate in recovery. With appropriate treatment recovery will usually occur within the space of a few days. Untreated cases or those which fail to respond to treatment, however, may persist for several weeks during which period the animal becomes emaciated and the already diminished milk flow may cease entirely. In prolonged cases the cow may be rendered worthless until the next lactation period. Severe emaciation and debility may result in the death of the animal. The mortality rate, however, is very low. Some animals are subject to recurrent attacks of the disease an apparent recovery accompanied by a return of appetite and rumination being followed shortly afterwards by a relapse.

## DIAGNOSIS.

From a consideration of the history of the attack and the symptoms exhibited the diagnosis of the disease will usually present little difficulty. When symptoms of loss of appetite, rapid wasting, greatly diminished milk yield and constipation occur during early lactation, acetonaemia should be suspected. If in addition the characteristic odour of acetone is detected in the breath or should any of the nervous symptoms described make their appearance this will provide confirmatory evidence. It is, however, necessary to mention that an odour of acetone may occasionally be present in the breath of apparently healthy cows or in cows suffering from some other diseases and it is consequently unwise to place absolute reliance on this feature alone. In order to confirm the diagnosis samples of milk or urine from an affected animal may be submitted to a simple chemical test in which a positive result is denoted by a colour reaction. A strongly positive reaction considered in conjunction with the symptoms will serve to place the diagnosis beyond doubt. When confirmation is desired milk or urine samples may be forwarded to this Department for testing. The amount of each need not exceed a fluid ounce and the sample should be despatched immediately after collection, otherwise it may prove unsuitable.

### TREATMENT.

The most rational method of treatment consists in the injection of a solution of the sugar glucose which results in a reduction of the toxic ketone bodies circulating in the blood accompanied by a corresponding improvement in the condition of the animal. The use of a 40 per cent, solution of glucose is recommended 500 cc. of which( approximately 7 ounces of glucose dissolved in 17 ounces of boiling water and allowed to cool) is injected into the jugular vein or subcutaneously (beneath the skin). A single injection may result in recovery but 4 or 5 injections repeated on successive days may be necessary before the desired result is obtained. When treatment of this kind becomes necessary it is desirable that the services of a veterinary surgeon should be obtained.

An alternative method of treatment which is very effective and may be applied by the dairy farmer consists in the administration of chloral hydrate, one ounce of which should be given night and morning for the first two days of treatment followed by half an ounce once daily for the next six days. In the administration of chloral hydrate the prescribed dose of the drug is dissolved in a pint of hot water and a pint of treacle or molasses added, the mixture being given to the cow in the form of a drench. Many cases of the disease will respond satisfactorily to this method of treatment. Since the actual cause of the disease has not been determined no really effective method of prevention can be advocated. Molasses given in the ration at the rate of 1 to 2 pints daily may be found beneficial and it has been shown to be capable of preventing the disease in cows which are subject to an annual attack. In addition it is a valuable adjunct to treatment.

# Animal Breeding.

A. J. MILLINGTON

*[In view of the wide interest being taken in Progeny Testing and other aspects of Animal Breeding, the following article, a talk given by Mr. Millington at Merredin on 22nd June, 1946, is reproduced with illustrations.—Editor.]*

ALTHOUGH to the casual observer, wild animals appear very uniform, close examination reveals considerable variability, which becomes more marked following domestication and particularly inbreeding. Man, as an agriculturist, has endeavoured to turn this variability to his own purposes by retaining those which are most profitable in respect to milk, wool egg or meat yield. The basis of most animal breeding is the rule "like begets like," but the conception is correct only in the broadest sense. It is certainly too inexact for effecting notable improvement within most of the established breeds of livestock.

Most farm animals have the capacity to beget progeny very unlike themselves in respect to their looks or even their production or ancestry, making these

characteristics very uncertain guides as to their progeny. In every generation there is a proportion of relatively unproductive animals which must be culled if the level of production is to be maintained.

**PERCENTAGE OF PROGENY WHICH MUST BE RETAINED AS REPLACEMENTS.....**

| Kind of Animal | Female | Male |
|---|---|---|
| Beef Cattle | 40-50 | 3-5 |
| Dairy .. | 50-65 | 4-6 |
| Sheep | 45-55 | 2-4 |
| Pigs | 10-15 | 1-2 |
| Fowls | 10-15 | ½-2 |

Data by Lush.

*The Ineffectiveness of Culling.*

Experience and innumerable experiments have shown that culling is a slow and ineffective method of eliminating the heredity which causes the low producers to appear. This is because in culling on the basis of production and appearance, the effects of indifferent heredity are often masked by high level feeding. It is also made ineffective, firstly by the inability to directly test the male for such important characteristics as egg or milk production and, secondly because high producers can transmit heredity which will give low production in the progeny.

Apart from the economic loss incurred in raising unproductive animals which must be eliminated at maturity, the scope for raising production by culling is restricted since in the large farm animals about one half of the females bred must be kept if numbers are to be maintained. However, even in the large stock only one male in twenty is required for breeding purposes, and this provides ample scope for selection.

Any breeding programme, therefore, becomes one of retaining the best of the twenty males, and its success will be determined largely by the efficiency of the selection methods used in eliminating the nineteen less desirable ones.

*Assessing Merit in Farm Animals.*

The three bases of selection used to assess merit in breeding animals are firstly, appearance; secondly, pedigree (merit in relatives); and thirdly, productivity. All three are dependent on heredity in part at least, and are, therefore, related to one another. No one of them or even all three in combination, is a good measure of heredity and genetics suggests the "genes" as a basic means of estimating the value of breeding animals. Genetics may be for the geneticist, but it does provide a universal currency in which the merit of breeding animals can be expressed. It also has laws which can predict the likely effectiveness of any breeding programme in producing animals in high genetic merit.

*The Gene.*

The "genes" are the units in heredity and from the breeder's viewpoint they differ in value. Any character can be assessed in terms of genes, and once purity has been obtained at whatever level of desirability, the animal will, for practical purposes, continue to breed true to that characteristic. The genes cannot be converted from one to another but they can be exchanged one for the other by breeding practices and real improvements once achieved are permanent.

*The Bridge between Generations.*

The contribution of the parents to the heredity of the progeny in terms of material is small beyond comprehension. The 1,500 or so million human beings at present inhabiting the earth, derive their heredity from microscopic amounts of material which, added together, would equal two drops of water, one from the fathers and one from the mothers. Minute as the quantities are, they apparently have the capacity, through the genes, for producing almost infinite variation.

Each characteristic of an animal such as horns, coat colour, milk production, is directly controlled by a specific gene or genes.

The gene which has the task of developing a character, such as red coat colour in cattle, goes on for generations in hundreds of thousands of beasts producing the chemical causing this result. Then, for some unknown reason, it produces a different substance, and this change is immediately expressed by a different basic coat colour, for example, black. The change is called a "sport" or mutation, and once effected is permanent. Over the thousands of years of evolution, genes have "sported" several times, so that each character has its alternative types. In respect to coat colour, one gene produces a substance which results in black hair, an alternative red hair, and a third white hair. By judicious breeding, the owner can manipulate the genes and obtain thereby beasts with any one of the three alternative coat colours.

*Genes and the "Pure Bred."*

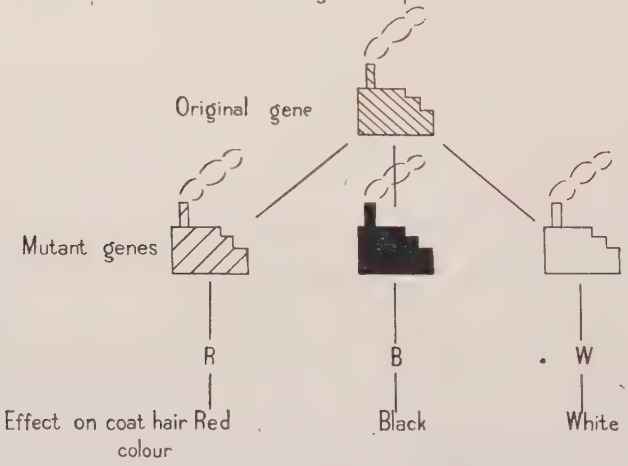
The "throwback" whereby an ancestral characteristic suddenly reappears is well known to animal breeders. It indicates a mechanism whereby heredity can be transmitted unchanged through generations without there being any visible evidence of its presence. This mechanism is necessary in nature to preserve the variability essential for evolution, and among domesticated animals, for strain selection.

## GENE FUNCTION

Each gene functions by manufacturing a chemical substance which produces a certain effect on the animal possessing it

During evolution each gene has "sported" (mutated) several times. The mutant produces a chemical different from that of the original gene and the change is reflected in the animal possessing it.

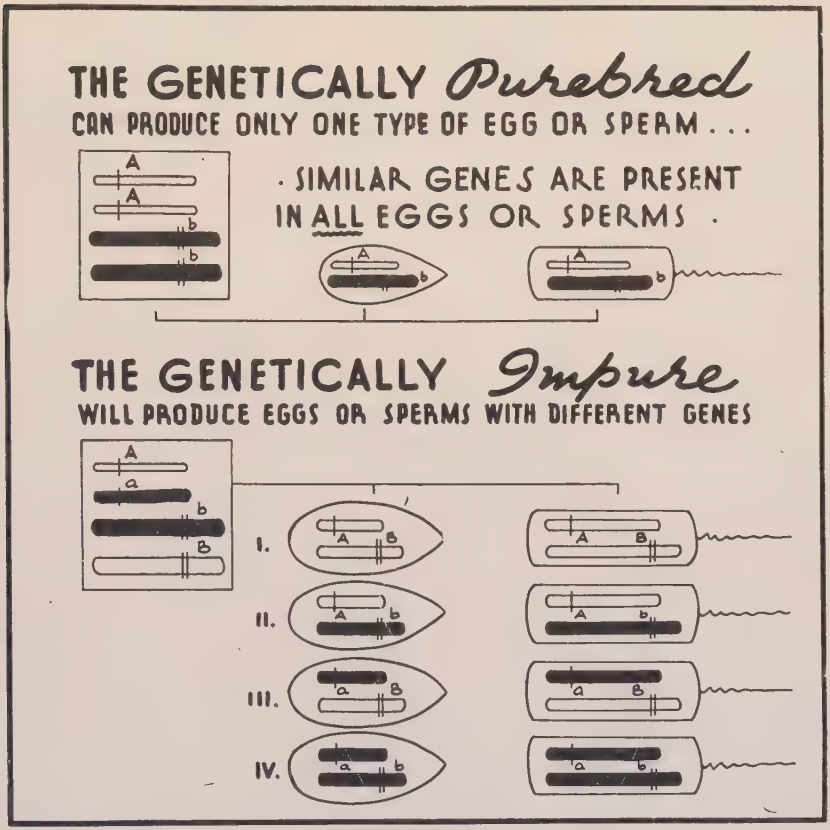
In cattle a beast may have a red, a black, or a white coat colour, depending on which of the three alternative genes it possesses.




Since the animal inherits a gene for coat colour from each parent, it can have either of the above in duplicate, or any two in combination. Some genes mask (dominate) others, so that when the pair is unlike, the beast may look like one parent or be intermediate between the two.

| Gene combinations | Coat hair colour |
|---|---|
| R R | Red |
| B B | Black |
| W W | White |
| R B | Black (Substance B prevents R from expressing itself) |
| R W | Red roan – a mixture of red and white hairs. |
| B W | Blue roan – a mixture of black and white hairs |

Animal breeding is difficult because most beasts are themselves the expression of a combination of the dual heredity which they received from their two parents. They usually possess considerable heredity which is not visible in themselves but which they can transmit to their progeny.


THE GENETICALLY Purebred
CAN PRODUCE ONLY ONE TYPE OF EGG OR SPERM . . .
· SIMILAR GENES ARE PRESENT
IN ALL EGGS OR SPERMS ·
THE GENETICALLY Impure
WILL PRODUCE EGGS OR SPERMS WITH DIFFERENT GENES
I.
II.
III.
IV.

The sperms or eggs of genetically pure animals all contain identical genes capable of producing only one type of animal. Genetically impure animals produce eggs or sperm with dissimilar genes resulting in variable progeny.

The dual behaviour is due in part to the animal possessing every gene in duplicate. In the Aberdeen-Angus for instance, each beast will have two genes for each characteristic such as black coat colour. One of the genes of each pair is derived from the sire and the other from the dam via the sperm and egg respectively.

Although the animal has a duplicate set of genes, the eggs or sperm which it produces will receive only one member of each pair. This mechanism is necessary to keep the number of genes constant. During the formation of eggs or sperm, the members of each pair are separated and only one or the other goes into each reproductive body. At fertilisation the duplicate condition is restored.

In the Aberdeen-Angus, the sperm of all males will receive one or other of the genes for black coat colour which the animal possesses. In respect to this character all the sperms are alike inasmuch as they can transmit only one type of

heredity. Similarly all the eggs of the females will carry the gene for black coat colour and the offspring will possess two genes, both producing the substances necessary for that coat colour. This is the genetic concept of the "pure bred." Because they can transmit only one type of gene to their progeny they can produce only animals identical with themselves in respect to heredity. This fixity makes "appearance," "performance" and "pedigree" reliable bases for selecting breeding animals.

Likewise in a herd of Red Poll cattle all the sires and dams will transmit the gene for red coat colour and only animals of this type possessing two genes for the character will be produced.

*The Cross and Gene Dominance.*

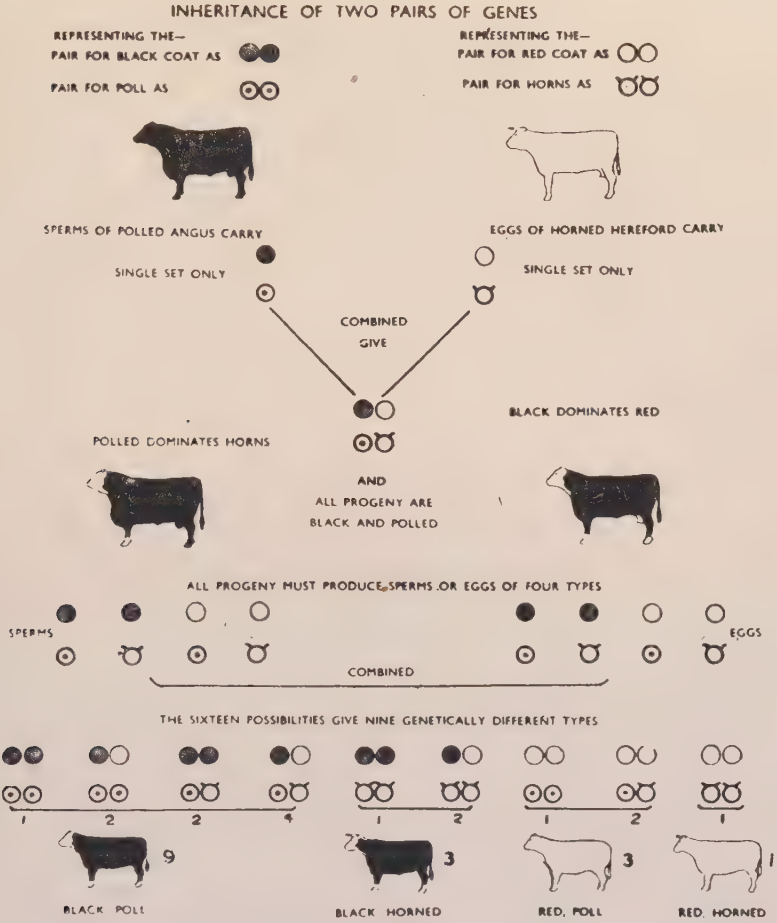
When a mating is made between the two breeds, the Aberdeen-Angus will transmit the gene for black and the Red Poll that for red coat colour. The crossbred animal will, therefore, have one gene producing the substances necessary for black and another those for red coat colour. The beast thus has the heredity necessary for a black, a red or an intermediate coat colour. Experimental breeding shows that the gene for black coat colour continues to function and the animal is visibly indistinguishable from a pure Aberdeen-Angus.

In the terminology of the monk Mendel, who was the first to effectively study the mating of unlikes, the gene for black is "dominant" and masks the "recessive" gene for red. That the gene for red is merely masked and passes unaltered through the black beast is shown by the 25 per cent. of red animals produced by matings between such crossbreds. Genes are indestructible and cannot be altered. They can be exchanged, however, and by breeding genetically pure animals the undesirable genes can be entirely eliminated from the flock or herd. The genetically "pure" bred can transmit only one type of gene for a character, whereas the "impure" or "unfixed" beast can transmit two different genes for that character and beget two types of progeny. There is a marked difference between the genetically "pure" and the "pure breeds" of farm animals, which are usually variable among themselves and also in respect to their progeny.

"Dominance" and "recessiveness" together with the duplication of the genes make the breeding animals' behaviour uncertain and the breeder's problem is to eliminate this characteristic from his stock. To ascertain whether his Aberdeen-Angus is pure for "polled" and "black" coat colour the beast should be mated with eight or so red, horned cows. If all the progeny are polled and black, the bull is pure, but any red or horned calves will indicate that he is genetically unfixed for these characters.

*Wrinkles in Merino Sheep.*

In the Australian Merino sheep, the plain body type is dominant to wrinkled. Consequently two plain animals can beget wrinkled progeny, which form the majority of culls in most flocks. Austin in his excellent book on the saga of the Australian Merino, stresses the importance of this in the introduction of the very wrinkly Vermont types and the subsequent attempts which have been made to eradicate their undesirable heritage from present day flocks. He deplores also the complacency of "corrective mating" with its subsequent heavy culling, rather than the elimination of the undesirable genes, and its consequence, the absence of the wrinkly cull in flocks. The detailed genetics of wrinkle are being investigated in Australia by C.S.I.R. and also in American institutions.

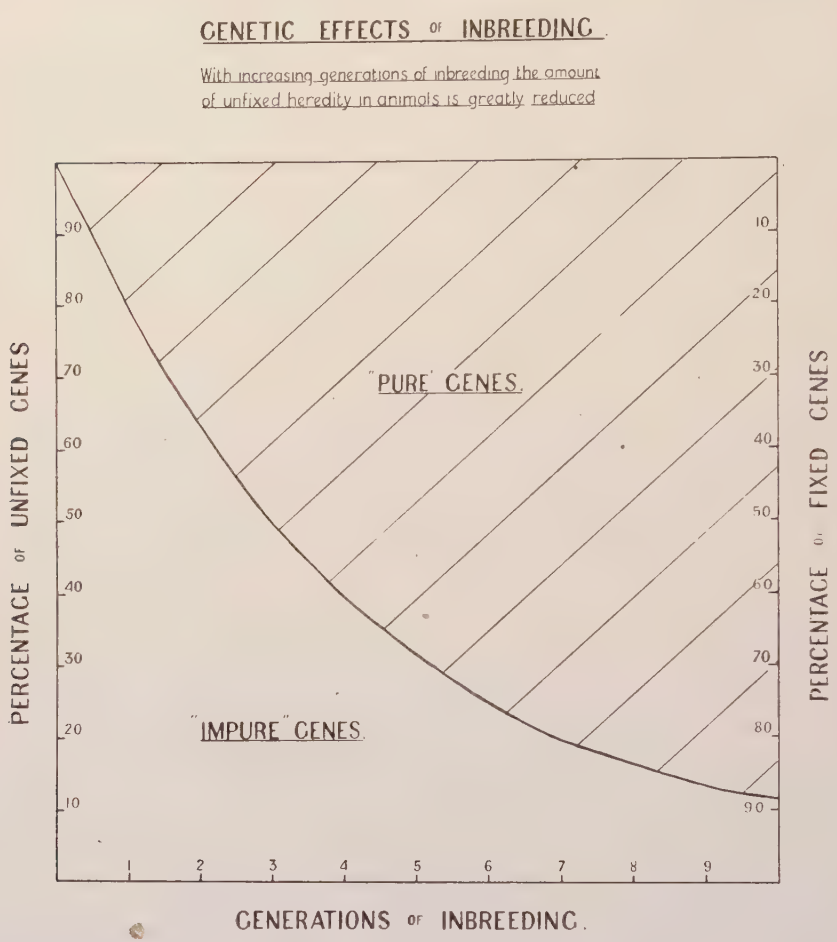



*The Inheritance of Commercial Production.*

Unfortunately except in poultry, genetic research has not identified as yet, the particular genes which control commercial production such as milk yield in dairy cows. Because, unlike hair, horns, etc., they are influenced by feeding and other environmental effects, the genes governing commercial production are difficult to identify and once identified, the "fixing" of them in a strain is long and laborious. The tools which the animal breeder has available for these difficult tasks are progeny testing and inbreeding. The former was commended by the Roman writers two thousand years ago, whilst inbreeding was used most effectively by the English husbandmen who founded the prominent breeds of livestock several hundred years ago.

*Breed Formation.*

During the formation of most breeds there is a period of intense breeding, that is, brother-sister or repeated parent progeny mating. The famous Shorthorn bull Comet, which sold for 1,000 guineas in 1810, had only one greatgrandfather, one grandmother and his father was also his grandfather. Inbreeding is the most powerful tool in the hands of the animal breeder, since it enables gains once made by breeding to be made permanent.




Ten generations of inbreeding will reduce the number of unfixed genes to a very low proportion. The greatest reduction will be in the first four or five generations.

*Inbreeding.*

The most noticeable result of inbreeding is the increase in uniformity of appearance and this is the outward expression of the effect of the technique on the genes. In the attached diagram it will be seen that both the genes in the Aberdeen-Angus are for "black" and in the Red Poll for "red" coat colour. As stated earlier the breeds are "pure" for these characters and all the eggs or sperm of the Aberdeen-Angus, will carry the gene for "black," and for "red" in the case of the Red Poll. The progeny of this cross will have one gene for "red" and one for "black," but the beasts would be black since that gene is, in Mendelian terminology, dominant to red. They would be genetically "impure" since they could transmit to their progeny either the gene for "black" or the gene for "red." The pure breeding beast can transmit only one type of gene to its progeny.

Matings between animals from the cross would be the first generation of inbreeding and would give both red and black animals. One half of the progeny would be "pure," however, as both their chromosomes would carry either the genes for "black" or those for "red."

Calculations indicate that there is about a 20 per cent. increase in gene purity with each generation of inbreeding so that the crossing of two animals which have fifty "unlike" or contrasting gene pairs like "red" and "black" coat colour above, will give progeny with that number of unfixed genes. Each generation of inbreeding will give a 20 per cent reduction amounting in this example, to 10 genes in the first, eight in the second, six in the third, etc., leaving 40, 32, 26, etc., unfixed genes respectively. The effects will, therefore, be most marked with the early stages of inbreeding when the greatest reduction in the number of unfixed genes will occur, the first three generations halving the number.

All the effects attributable to inbreeding are due to the increased gene purity, which accompanies it. Where animals are already highly inbred its effects will not be as marked as with nondescripts, which will have a large number of unfixed genes. Since inbreeding will give pure breeding animals which will produce beasts very similar to themselves, it makes the guides in selection, appearance, performance and pedigree much more reliable.

*Inbreeding and Culling.*

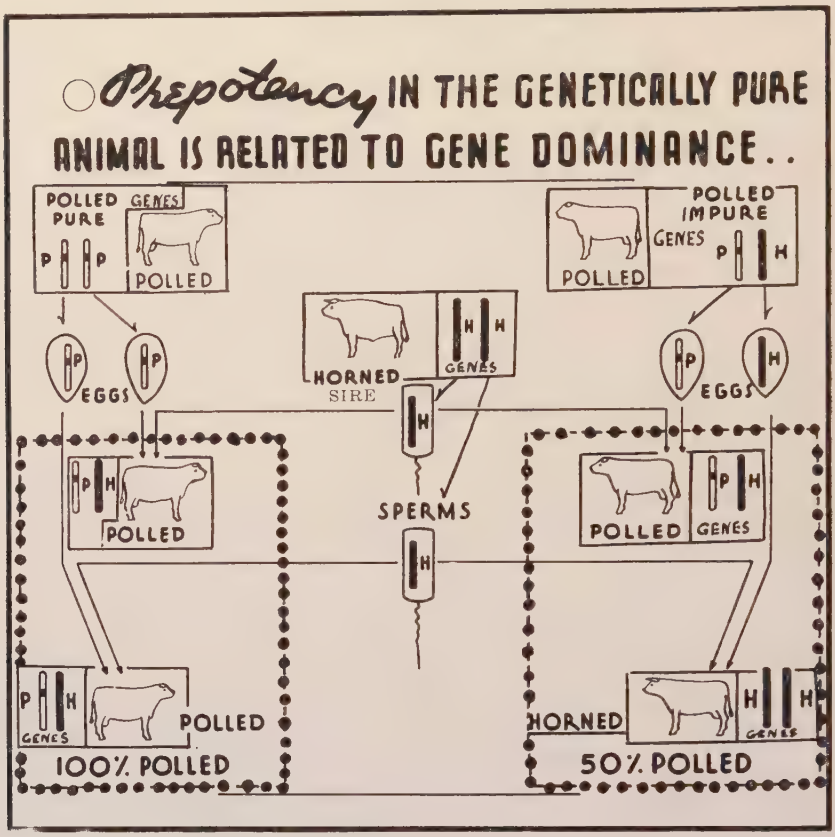
Most animal breeders avoid inbreeding, because they claim that it will be followed by a loss of vigour and perhaps fertility. Geneticists believe that vigour is related principally to the dominant genes, which by convention, are written with the capital letter. Many of these will be effective whether they are in the pure dominant AA or in the unfixed Aa condition. With inbreeding there is a marked reduction in the Aa class and an increase of those pure for the dominant AA condition or the recessive aa condition. The animals pure for the recessive may exhibit an undesirable character, such as low fertility, and if they can be culled, the trait will be removed from the flock or herd. Inbreeding does not, of itself, cause the appearance of the undesirable characters, it merely increases the proportion of animals showing them. Animal owners not in a position to cull sufficiently to eliminate the undesirables may fix unsatisfactory traits as well as favoured ones in the herd.

*Inbreeding and Prepotency.*

The degree to which the progeny of an animal shows the parental characters, is the measure of its "prepotency" and it is dependent on gene purity for a number of dominant characters. Pure polled animals are highly prepotent since all their progeny with the common horned animals will be polled. Impure polled animals in crosses with horned beasts would beget 50 per cent. of animals showing the recessive character "horned" and their prepotency would be correspondingly less. Prepotency is sometimes regarded as synonomous with the gene purity of "pure breeds" but it is dependent also, on dominance.

*Inbreeding and Commercial Practice.*

Since the inbreds are often less vigorous than the outbreds, they may not appear to be such valuable parents as the latter. The production of inbred animals, of high merit as individuals, is extremely difficult and expensive because of the intense culling required, and as the gene purity cannot be assessed by visible means, inbred animals seldom command a premium compatible with their merit as parents. Current methods of assessing animals as parents tends to underestimate the value of the inbred and grossly over-estimate the merit of the unfixed beast.




Although the horned sire is genetically pure for this characteristic, mated with a polled animal only half of his progeny at most can be polled.

*Line Breeding.*

Most breeders favour line or family breeding. An endeavour is usually made to confine matings to the progeny of some famous animal, but intense inbreeding is avoided. Line breeding may mean much or little, depending on the degree of gene purity attained by previous inbreeding. The crossing of two inbred lines is similar in principle to crossing two breeds, since it usually gives animals of great merit as individuals, but with a large number of unfixed genes, which makes them unsatisfactory as foundation animals for line breeding. Such crosses between inbred lines were used successfully by English breeders to provide material for an inbreeding programme. Line breeding will not have measurable advantage over random mating unless the foundation animals have been inbred to a point where the important breed characteristics have been fixed.

*Cross Breeding.*

During the inbreeding associated with the formation of a breed or strain, there is some loss of the dominant genes which impart vigour. These are additive in their action and no one breed is usually as vigorous as the first generation combination of two, since one supplies dominant genes absent in the other.

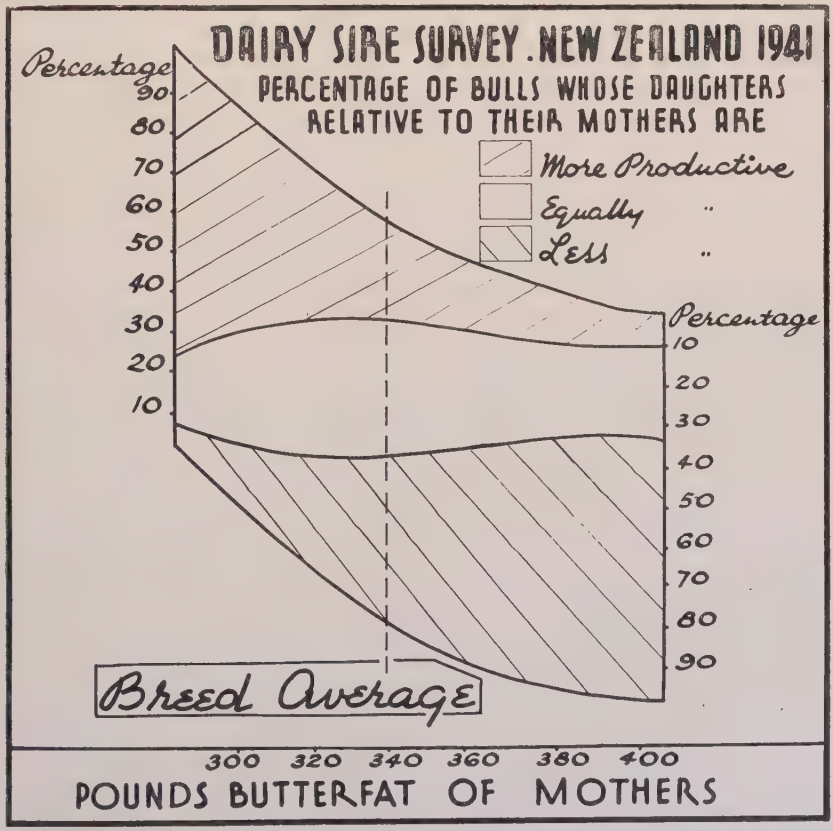
The vigour resulting from crosses between different breeds or inbred strains, will vary with the capacity of one to supply the deficiencies of the other. Because of the large number of unfixed genes in the first generation of the cross, they are not suitable for breeding, except to provide animals for the butcher.

*Mating by Appearance.*

The advantages of inbreeding, implying as it does mating by relationship, is that it automatically mates "like genes to like" in the most efficient manner. Environmental influences result in matings between apparently "like" animals in respect to production being between genetically "unlike" animals. When matings are between animals of similar merit in respect to production regardless of relationship, they are not likely to be effective in "fixing" the characters for which selection is being made. Progeny testing can be used, however, to markedly increase the efficiency of this type of mating, since it enables the owner to ascertain whether the characteristics which the animal exhibits are due to environment or are heritable and will be transmitted to the progeny.

*Progeny Testing.*

It has been shown by Lush that the demand for replacements seriously limits the scope for selection among females, particularly in the larger farm animals. The males can, however, be culled very severely and the improvement effected will be a measure largely of the accuracy with which their relative merits as sires are assessed.




Mated to cows with production above the breed average, few bulls are capable of maintaining production and still fewer of raising it.

Where the value of the male can be assessed directly as for meat and wool production, limited direct selection can be practised on the basis of growth rates and conformation. For egg and milk production, however, the male can be tested only by the merit of *all* his female progeny relative to that of their mothers.

Most animals are progeny tested eventually, and the value of the present day pedigree would be increased immeasurably by including all progeny and not just the selected superior ones.

A survey of the sires used in the New Zealand dairy industry in 1941, showed that only one bull in ten was capable of increasing the production of the daughters relative to their mothers, when they were above the average of the breed. Two out of every three bulls lowered the level of production under similar circumstances.

The average of the breed, relative to other breeds and nondescripts, is largely determined by the degree to which the genes for productivity are fixed in it. The inbreeding which characterises the early stages of breed formation "fixes" the breed average which is maintained almost unaltered by ordinary culling and selection. Without progeny testing superior cows are mated to bulls which are unable to contribute the superior genes necessary for high productivity, and the daughter's production is only average or slightly better. Progeny testing is similar in principle to prepotency for visible characters, since unless the sire is fairly pure of the genes controlling production, he will not be able to raise the level of production.

*The Danish System.*

The Danes sought to express merit on a tangible basis and being an eminently practical people, they concerned themselves primarily with the essential function of farm animals, that is, the conversion of feeding stuffs into meat, milk or eggs. Animals differ markedly in the efficiency with which they make the conversion and the variation is mainly due to heredity. However, under conditions of luxury feeding which exists in some Australian studs, the least efficient perform as well as the more economical animals.

The solution arrived at by the Danes to the problem of ascertaining which boars and sows produce the most efficient pigs, was to take random samples of four weaners from a litter and raise them on a standard, but adequate, ration at a central testing station. The amount of food required to produce one pound of flesh and the merit of the carcass were recorded to indicate the capacity of the parents to transmit desirable heredity to their progeny.

The breeding stations or stud farms in Denmark are privately owned, but licensed by the Government. They are frequently inspected for disease by veterinarians, and their general operations are supervised by a committee of local farmers, and others, organised on much the same lines as were our District War Agricultural Committees. The visiting committee ensures that all breeding animals are tattooed for identification purposes, and that a sound mating programme is followed, based on adequate progeny testing. Before the war, Denmark supplied about 60 per cent. of England's bacon imports and it is reasonable to assume that their elaborate system of progeny testing was profitable, since it was financed largely by the farmers themselves through their co-operatives. In Denmark only pigs which have been adequately progeny tested are eligible for Breed Registration, pedigree alone being insufficient. The Danish system ensures that purchasers of stud animals will acquire beasts capable of transmitting to their progeny the heredity necessary for efficient commercial production.

*Artificial Insemination.*

The most recent objective accounts available indicate that whilst at the technical level, the Russians have reached much the same point as the British, the scale upon which they use artificial insemination is almost stupendous. For 1947 it is proposed to inseminate something like 20 million sheep, a colossal task in itself. There is also evidence that the technique is being used to grade up primitive stock with more productive strains and that an elaborate system of progeny testing is practised.

Unless progeny testing accompanies artificial insemination the undesirable effects of the technique will outweigh its advantages. All sires should be progeny tested and inbred to a number of their daughters to reveal undesirable recessive genes before they are used for artificial insemination. The great value of artificial insemination is that it enables proven sires, despite their advanced age, to be widely used.

*Choosing Breeding Stock.*

Improvement by breeding is a long term project and should be approached cautiously. In purchasing stud animals it is desirable first to know the breeder and the degree to which he isolates his breeding stock. The continual introduction of "outside blood" may produce a few superior animals, but in the long term it increases gene variability and reduces the productivity of the strain to the level of the breed.

*The Stud Animal.*

In selecting a stud from which to derive animals, the purchaser would be influenced firstly by the suitability of the type to his requirements, and secondly the uniformity of its members. The aim is the purchase of gene purity and not just good looks in an animal. In a well conducted stud there will be little difference in the genetic constitution of the 1,000 guinea and the ten guinea sire, although due to environmental effects, they may look dissimilar. Studs which can provide a range of types from one extreme to the other should be avoided at all costs, since this indicates low prepotency and subsequently heavy culling.

Before the American animal husbandmen began the compilation of their Agricultural Yearbooks on heredity, published in 1936 and 1937, they anticipated that it would be comparatively easy to issue a list of breeders who could supply animals like the Danish ones, capable of giving desirable stock. Such a list would enable a farmer, by purchasing males from one source, to grade up his own animals, so that in three or four generations they would be equal, in respect to production, to the beasts of the stud from which they were bred.

In both America and Australia unfortunately, the merit of studs is assessed chiefly on the basis of show ring awards and the fabulous prices obtained for some selected animals. Show awards do not attempt to measure the capacity of animals to transmit their merit to progeny whilst sale ring prices may be, at times, a form of advertising.

*The Agricultural Show.*

Agricultural shows, like horseracing, have as their objective the improvement of the breed. Unfortunately, as awards are made entirely on appearance, they give minor, non-commercial characteristics, such as hair and horns, more emphasis than the production of milk or eggs. Further, they do not guarantee that the animal is capable of producing a gallon of milk or laying a dozen eggs.

Shows also set up arbitrary standards which prevent the development of pure breeding beasts and greatly increase the number of characters for which selection may be made.

In the Barred Plymouth Rock fowl for instance, the barring gene is associated with sex. This results in the pure breeding barred male being much lighter in colour than the female or the rooster impure for barring. However, because the show-ring demands that the male be dark in appearance like the female, the impure rooster will always win the award. This is despite the fact that one half of his daughters will be black and one half of his sons too light in colour for exhibition. In effect, on the basis of show standards one half of his progeny must be discarded, and this makes improvement in the commercially important characteristics such as egg production just twice as difficult. A survey would undoubtedly reveal many similar instances where compliance with show standards results in an animal which cannot reproduce itself in a large proportion of its progeny.

The creation of special classes at agricultural shows for adequately progeny tested livestock would direct attention to the first essential in a breeding animal, namely, its capacity to beget superior progeny. Awards in this section would then be a really useful guide to buyers, and breeders would be compelled by competition to make their studs functional sources of superior breeding material.

*Performance as a Guide in Selection.*

Performance, particularly where it is repeatable, as in egg or milk production is a valuable aid to selection, when records are available for a three to four year period.

Although many animals possess the desirable characteristics themselves, the genes are unfixed and they were unable to transmit them all to even one half of their progeny. Performance should, therefore, usually be discounted in selection, since the progeny will deviate towards the general average of the breed.

*Grading up.*

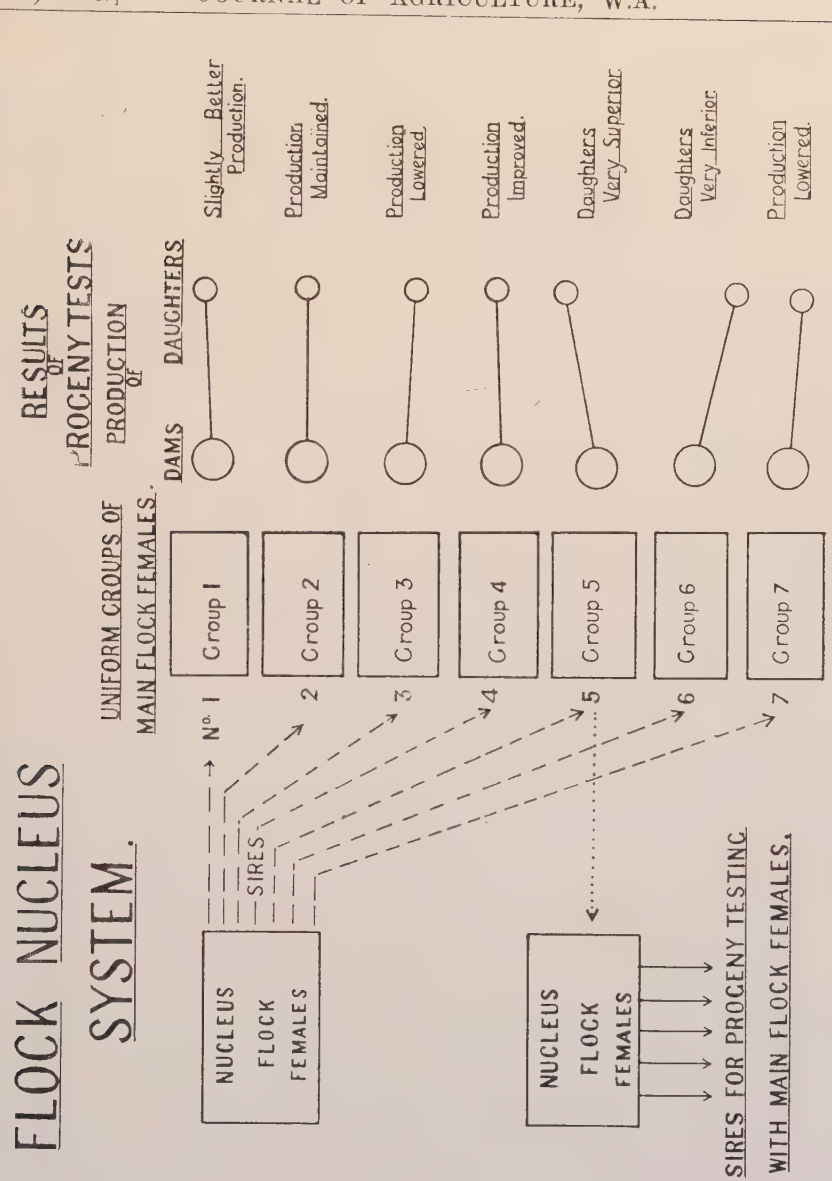
The continued use of sires of one breed on those of another or scrub animals will give, in five or six generations, a group indistinguishable from pure breds. The greatest vigour will occur in the first generation animals and the improvement in each will become progressively less. The same effects will be obtained from crosses between strains of the same breed.

*Flock Nucleus System.*

When introducing sires it is desirable to progeny test them on random groups before choosing one for use with the selected or nucleus females. This system of maintaining two flocks, one a main group for progeny testing sires and the other an elite group for mating only with tested animals, is advocated by Hagerdoorn and other geneticists. The effectiveness of the system will depend on the refinement possible on various farms, but it is the powerful aid to animal improvement by breeding.

*The Permanence of Breed Improvement.*

It may well be asked, in the case of the larger farm animals at least, whether the time, effort and expense necessary in the production of animals possessing superior heredity, is justified. However, unlike the action of environment such as feeding, which must be repeated in every generation, improvement in heredity, once effected, is permanent. It reduces or eliminates the need for culling unprofitable animals to attain a high level of production.




A nucleus of superior females which are mated only with progeny tested sires, is maintained. These matings provide the young males for progeny testing on groups of the main flock.

The greatest progress in animal breeding has probably been made with poultry. Working with Rhode Island Red birds, American breeders have developed from a flock capable of laying perhaps 100 eggs per hen, and 95 per cent. broody, one averaging 240 eggs yearly and 3 per cent. or less broody. This high egg production is repeated year after year, and is made absolutely without culling or disposal of birds, except those that die. Egg size, shell colour and texture, as well as bird size, have been improved along with production. Once the heredity of the bird is fixed or permanent for high egg production, it is only necessary to practice correct housing and feeding to ensure productivity.

By contrast, in an Australian flock, where all the pullets are tested for egg production and those which lay over 200 eggs in their pullet year are used in the breeding pens, only one half of their daughters lay 200 eggs, and the average production is only about 150. All the males used as sires are from hens which lay over 200 eggs. To attain a production of 200 eggs per bird in this flock it is, therefore, necessary to cull at least 50 per cent. of the pullets each year. Probably 70 to 80 per cent. would have to be culled to give the performance of the American birds.

*Breeding and Environment.*

Plant improvers have aimed at providing plants for specific environments by breeding them in the conditions which they are likely to encounter under commercial production.

Animal breeders have usually tended to carry out their selection under the most favourable conditions of luxury feeding. These are often in marked contrast to those which the animal's progeny will encounter. Enlightened breeders are tending to adopt the plant breeder's outlook, but it behoves the animal owner to make quite sure that breeding and not feeding is the limiting factor in production. The animal and its environment are inseparably related and must receive joint consideration.

## SUMMARY.

Breeding animals have a dual personality inasmuch as they possess the capacity to transmit heredity of which they give no visible evidence. This is because the various characteristics may be considered as units whose expression is governed by the fundamental force in heredity, the gene.

The genes are present in a duplicate condition, since each parent contributes a complete set for each character. Many genes are "dominants" and prevent the expression of "recessive" ones when both are present in an animal. An animal which possesses unlike genes is impure for that character, and will not breed true. When the gene pair is identical only one type of gene, hence heredity can be transmitted resulting in a pure breeding animal.

Animal breeders have, in progeny testing and inbreeding, two powerful tools for lifting the level of production. Only animals which are relatively pure for the genes giving high production will perform well in progeny tests. By inbreeding, to these proven sires, the breeder can rapidly fix the genes for high production. Artificial insemination by extending the useful life of proven sires, will be a valuable aid to animal improvement by breeding.

The merit of a breeding animal is its capacity to beget high producing progeny.

# Pure-Bred Herd Recording, 1945-46.

M. Cullity, Superintendent of Dairying, and B. H. Drakes.

THERE has been a slight increase in the number of herds under test, but this represents only a very small proportion of the total number of pure-bred herds of the three breeds in the State, which approximate 260 registered with the societies, 34 only being submitted for test.

In all the production of 424 cows was recorded; of these 31 were withdrawn for various reasons before being under test 150 days and their yields have not been included in the averages. The remaining 393 cows averaged 279.3 lbs. butter-fat, which is 9.49 lbs. below last year's average.

This is the lowest for many years and is due to many factors. A steady decline has occurred since 1941-42—this may be attributed to causes brought about by war conditions—such as shortage of labour, fertiliser and feedstuffs. The low average recorded during the past year, however, cannot be attributed to these reasons and appears to be largely due to adverse seasonal conditions.

A number of individual high herd averages were obtained and this suggests that with improved feeding and management the level of production of purebred herds can be raised appreciably within a short period.

The average production of all cows completing test since 1934 is shown in the following table.

Table 1.
PURE-BRED HERDS, 1934–46.

| Year. | No. of Cows Completing Test. | Average Butter Fat per Cow. |
|---|---|---|
| | | lb. |
| 1934–35 ... ... ... ... ... | 305 | 320·26 |
| 1935–36 ... ... ... ... ... | 367 | 297·17 |
| 1936–37 ... ... ... ... ... | 319 | 300·87 |
| 1937–38 ... ... ... ... ... | 333 | 298·08 |
| 1938–39 ... ... ... ... ... | 375 | 292·40 |
| 1939–40 ... ... ... ... ... | 382 | 305·88 |
| 1940–41 ... ... ... ... ... | 372 | 298·38 |
| 1941–42 ... ... ... ... ... | 290 | 322·84 |
| 1942–43 ... ... ... ... ... | 294 | 321·27 |
| 1943–44 ... ... ... ... ... | 289 | 311·57 |
| 1944–45 ... ... ... ... ... | 344 | 289·42 |
| 1945–46 ... ... ... ... ... | 393 | 279·93 |

It will be seen that there has been no improvement in production during that period. This should be the cause of concern to all stud breeders who might with advantage canvas methods of improving the position.

In view of the expressed opinion that seasonal conditions were responsible for the decline in production last year, it is appropriate to add that greater attention to feeding should in the great majority of cases give an immediate improvement in yields.

The percentage of cows passing standard is given in table 2.

This table shows a very serious retrogression and again is one which should be studied carefully by breeders who submit their herds for testing.

It will be noted that in the Guernsey breed there has been a steady decline in the proportion of cows passing standard since 1939-40; with the Australian

TABLE 2.

PERCENTAGE OF COWS PASSING STANDARD.

| Year. | Australian Illawarra Shorthorn. | Guernsey. | Jersey. | Total. |
|---|---|---|---|---|
| | % | % | % | % |
| 1937–38 .... .... .... .... | 59·1 | 68·7 | 35·6 | 53·1 |
| 1938–39 .... .... .... .... | 53·8 | 71·4 | 55·2 | 57·9 |
| 1939–40 .... .... .... .... | 48·0 | 77·5 | 64·2 | 59·2 |
| 1940–41 .... .... .... .... | 52·0 | 61·0 | 51·0 | 54·0 |
| 1941–42 .... .... .... .... | 73·1 | 68·3 | 59·7 | 68·3 |
| 1942–43 .... .... .... .... | 67·6 | 67·9 | 55·0 | 64·3 |
| 1943–44 .... .... .... .... | 57·8 | 52·1 | 73·3 | 61·9 |
| 1944–45 .... .... .... .... | 52·5 | 43·4 | 72·2 | 57·3 |
| 1945–46 .... .... .... .... | 43·1 | 33·3 | 52·9 | 43·8 |

Illawarra Shorthorns the decline has been continuous since 1941-42. The percentage of all cows passing standard has fallen by 13.5 per cent. compared with the previous year, the greatest decline having occurred in the Jersey breed, which was nearly 20 per cent. below the previous proportion; the number passing standard, however, for this breed was higher than in the other two.

The number of cows passing standard and the proportion in each age group for each breed is shown in table 3.

TABLE 3.

COWS PASSING STANDARD.

| Age Class. | A.I.S. | | Guernsey. | | Jersey. | | All Breeds. | |
|---|---|---|---|---|---|---|---|---|
| | No. of Cows Tested. | No. Passing Standard. | No. of Cows Tested. | No. Passing Standard. | No. of Cows Tested. | No. Passing Standard. | No. of Cows Tested. | No. Passing Standard. |
| Mature .... .... .... .... | 41 | 15 | 48 | 12 | 42 | 14 | 131 | 41 |
| Senior 4 years .... .... .... | 12 | 4 | 5 | 1 | 10 | 6 | 27 | 11 |
| Junior 4 years .... .... .... | 8 | 1 | 5 | 2 | 9 | 6 | 22 | 9 |
| Senior 3 years .... .... .... | 17 | 7 | 10 | 2 | 12 | 9 | 39 | 18 |
| Junior 3 years .... .... .... | 22 | 2 | 11 | 2 | 17 | 11 | 50 | 15 |
| Senior 2 years .... .... .... | 26 | 11 | 10 | 6 | 14 | 6 | 50 | 23 |
| Junior 2 years .... .... .... | 57 | 39 | 16 | 10 | 32 | 20 | 105 | 69 |
| Total .... .... .... | 183 | 79 | 105 | 35 | 136 | 72 | 424 | 186 |
| Percentage .... .... | 43·1 | | 33·3 | | 52·9 | | 43·8 | |

The only pleasing feature in this table is the relatively better performance recorded by the Junior two-year-old cows.

It will be noted that the mature cows for an unexplained reason have been particularly disappointing.

In the Mature class, the Jersey cows were the only ones which showed a higher average than last year. In the Senior three-year-old class the Shorthorns and Jerseys showed improved figures. In the Senior two-year-olds the Guernseys had an increased average, while in the Junior two-year-old class the Shorthorns and Guernseys recorded an improvement with the Jerseys registering a fall in production.

A comparison between the yields of all cows under test more than 150 days and those of cows which completed 273 days is shown in table 5. The information is tabulated according to breed and age class.

TABLE 4.

AVERAGE BUTTER FAT PRODUCTION IN EACH CLASS.

| Age Class. | A.I.S. | | | Guernsey. | | Jersey. | | All Breeds. | |
|---|---|---|---|---|---|---|---|---|---|
| | Standard required. | No. of Cows. | Average Butter Fat. | No. of Cows. | Average Butter Fat. | No. of Cows. | Average Butter Fat. | No. of Cows. | Average Butter Fat. |
| | lb. | | lb. | | lb. | | lb. | | lb. |
| Mature .... .... .... .... | 350 | 39 | 294·12 | 44 | 284·86 | 33 | 345·02 | 116 | 305·09 |
| Senior 4 years .... .... .... | 330 | 12 | 274·64 | 4 | 294·16 | 10 | 338·65 | 26 | 302·34 |
| Junior 4 years .... .... .... | 310 | 8 | 234·93 | 5 | 316·95 | 9 | 330·75 | 22 | 292·77 |
| Senior 3 years .... .... .... | 290 | 17 | 253·17 | 9 | 257·08 | 12 | 361·96 | 38 | 288·45 |
| Junior 3 years .... .... .... | 270 | 21 | 210·28 | 10 | 220·27 | 16 | 335·58 | 47 | 255·06 |
| Senior 2 years .... .... .... | 250 | 25 | 236·92 | 9 | 291·85 | 11 | 254·43 | 45 | 252·19 |
| Junior 2 years .... .... .... | 230 | 55 | 259·76 | 16 | 266·91 | 28 | 266·62 | 99 | 262·86 |
| | | 177 | | 97 | | 119 | | 393 | |

TABLE 5.

COMPARATIVE TABLE SHOWING AVERAGE PRODUCTION IN EACH AGE CLASS OF COWS UNDER TEST 150 DAYS OR OVER AND COWS COMPLETING 273 DAYS

| Age Class. | Standard Butter Fat. | A.I.S. | | | | Jersey. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. of Cows Tested 150 days or over. | Average Butter Fat. | No. of Cows Completing 273 days. | Average Butter Fat. | No. of Cows Tested 150 days or over. | Average Butter Fat. | No. of Cows Completing 273 days. | Average Butter Fat. |
| | lb. | | lb. | | lb. | | lb. | | lb. |
| Mature .... .... .... | 350 | 39 | 294·12 | 26 | 345·90 | 33 | 345·02 | 24 | 383·13 |
| Senior 4 years .... .... | 330 | 12 | 274·64 | 10 | 287·06 | 10 | 338·65 | 8 | 385·33 |
| Junior 4 years .... .... | 310 | 8 | 234·93 | 5 | 299·63 | 9 | 330·75 | 3 | 348·83 |
| Senior 3 years .... .... | 290 | 17 | 253·17 | 11 | 282·30 | 12 | 361·96 | 12 | 361·96 |
| Junior 3 years .... .... | 270 | 21 | 210·28 | 8 | 239·48 | 16 | 335·58 | 13 | 353·57 |
| Senior 2 years .... .... | 250 | 25 | 236·92 | 14 | 275·46 | 11 | 254·43 | 8 | 275·13 |
| Junior 2 years .... .... | 230 | 55 | 259·76 | 46 | 281·42 | 28 | 266·62 | 24 | 273·43 |

| Age Class. | Standard Butter Fat. | Guernsey. | | | | All Breeds. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. of Cows Tested 150 days or over. | Average Butter Fat. | No. of Cows Completing 273 days. | Average Butter Fat. | No. of Cows Tested 150 days or over. | Average Butter Fat. | No. of Cows Completing 273 days. | Average Butter Fat. |
| | lb. | | lb. | | lb. | | lb. | | lb. |
| Mature .... .... .... | 350 | 44 | 284·86 | 34 | 315·88 | 116 | 305·09 | 84 | 343·19 |
| Senior 4 years .... .... | 330 | 4 | 294·16 | 2 | 338·17 | 26 | 302·34 | 20 | 331·48 |
| Junior 4 years .... .... | 310 | 5 | 316·95 | 3 | 337·49 | 22 | 292·96 | 11 | 323·38 |
| Senior 3 years .... .... | 290 | 9 | 257·08 | 5 | 282·96 | 38 | 288·45 | 28 | 316·56 |
| Junior 3 years .... .... | 270 | 10 | 220·27 | 5 | 269·30 | 47 | 255·06 | 26 | 303·80 |
| Senior 2 years .... .... | 250 | 9 | 291·85 | 8 | 315·51 | 45 | 252·19 | 30 | 276·05 |
| Junior 2 years .... .... | 230 | 16 | 266·91 | 14 | 277·01 | 99 | 262·86 | 84 | 278·40 |

It will be noted in each case—as would be expected—that the averages of those cows completing the full 273 days were considerably higher than the average, including those which completed their lactations in a lesser time.

Of the 393 cows included in the averages, 283—or 72 per cent. only—completed the full 273 day testing period.

It is pleasing to record that in the case of the Jersey cows, the average for each age-class for those completing a full period was higher than the standard for the class. The mature Guernsey cows and all classes of Shorthorns with the exception of the two-year-olds did not reach the standard.

*Leading Sires.*

The three leading sires for the year were "Austral Park Wonderful Standard" owned by Miss Hancock, "Mornmoot Northwood Beau," owned by R. H. Rose and Son, and "Summerlea Churchill," owned by the Claremont Hospital for the Insane.

The adjusted average for the production of the six best daughters in each case was 573.2 lbs., 527.9 lbs., and 422.5 lbs. butter-fat respectively.

Details of the average for the selected and for all daughters are shown in table 6.

In table 7 are given the performances of the three best sires for the years 1943-44, 1944-45 and 1945-46:—"Austral Park Wonderful Standard," "Mornmoot Northwood Beau," and "Grass Vale Gold Boy"—the average age-adjusted-yield of the daughters of these bulls for the three years being 517.6, 487.6 and 480.1 lbs. respectively.

These productions are very pleasing and indicate careful management on the part of the herd-masters in each case.

*Leading Cows.*

The productions of the leading three cows in each age class are shown in table 8.

*New Records.*

New records were established by three Jersey cows.

*Junior Three-year-old Class, Jerseys.*

"Juadine Peerless Lily 20th," owned by Miss L. G. Hancock of Harvey, produced 8,976 lbs. milk, average test 6.10 per cent., 547.67 lbs. butter-fat, thus exceeding the production of the previous holder of this record, "Camden Ariadne" owned by Mr. C. E. Kruger, of Pinjarra, whose figures were 7,980 lbs. milk, average test 6.65 per cent., and 530.88 lbs. butter-fat.

"Juadine Peerless Lily 20th" did not hold this record for long as it was later exceeded by over 100 lbs. by the cow "Grass Vale Northwood Eve," owned by Messrs. R. H. Rose and Son of Burekup, who produced 11,511 lbs. milk, average test 5.69 per cent., and 655.15 lbs. of butter-fat, thus establishing new records in the following classes:

Junior three-year-olds—Jersey.
Junior three-year-olds—All breeds.
Junior three-year-olds—West Australian bred.

*Mature Class, Jerseys.*

"Juadine Peerless Lily 13th" gained yet another success by exceeding the previous record in this class with 10,510 lbs. milk, average test 6.48 per cent., and 681.73 lbs. butter-fat.

The previous record had been held since 1934 by "Banyule Silvermine 55th," whose production was 11,759 lbs. milk, average test 5.76 per cent. and 677.97 lbs. butter-fat.

"Juadine Peerless Lily 13th" now holds seven State records:—

Mature cow class—Jersey breed.
Senior four-year-old—Jersey breed, West Australian bred, and all breeds.
Senior three-year-old—Jersey breed, West Australian bred, and all breeds.

TABLE 6.

LEADING THREE SIRES.

| Name of Bull. | Owner. | Sire. | Dam. | Average Production of six best daughters. | | Number of daughters under test. | Average Production. | |
|---|---|---|---|---|---|---|---|---|
| | | | | Without allowances (lbs. butter fat). | With allowances (lbs. butter fat). | | Without allowances (lbs. butter fat). | With allowances (lbs. butter fat). |
| Austral Park Wonderful Standard (Jersey, (12423) | ... ... ... | Ellerdale Wonderful Masterman (11561) | Ellerdale Wonder's Golden (47992) | 525·91 | 573·23 | 8 | 475·18 | 517·61 |
| Mornmoot Northwood Beau (Jersey) (17798) | R. H. Rose & Son | Glen Iris Golden Beau (14629) | Mornmoot Northwood Madeira 7th (63202) | 466·18 | 527·99 | 10 | 410·41 | 481·72 |
| Summerlea Churhill (A.I.S.) (6236) | Claremont Hospital for Insane | Summerlea Togo (1527) | Summerlea Empress 7th (14247) | 326·40 | 422·55 | 12 | 298·24 | 391·37 |

TABLE 7.

AVERAGE PRODUCTION OF DAUGHTERS OF THE LEADING THREE HERD SIRES, 1943–44 to 1945–46.

| Name of Bull. | Sire | Dam. | Average Production of Six Best Daughters. | | No. of Daughters Tested. | Average Production. | |
|---|---|---|---|---|---|---|---|
| | | | Without allowances (lbs. butter fat). | With allowances (lbs. butter fat). | | Without allowances (lbs. butter fat). | With allowances (lbs. butter fat). |
| Austral Park Wonderful Standard (Jersey) 12423 | Ellerdale Wonderful Mastman 11561 | Ellerdale Wonder's Golden 47992 | 569·88 | 619·32 | 14 | 470·06 | 517·57 |
| Mornmoot Northwood Beau (Jersey) 17798 | Glen Iris Golden Beau 14629 | Mornmoot Northwood Madeira 7th 63202 | 474·04 | 590·33 | 19 | 393·33 | 487·63 |
| Grass Vale Gold Boy (Jersey) 14684 | Belgonia Gold Boy 12458 | Grass Vale Lady Fowler 17th 48536 | 464·90 | 519·08 | 12 | 436·51 | 480·08 |

TABLE 8.

## THREE LEADING COWS IN EACH AGE CLASS, 1945–46.

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight Last Day of Test. | Weight of Milk for Period. | Average Test. | Weight of Butter Fat for Period. | Owner. | Sire. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | lb. | % | lb. | | |
| **MATURE COWS—STANDARD 350 LB. BUTTERFAT.** | | | | | | | | | | | |
| Juadine Peerless Lily 13th .... | Jersey | 76977 | 20-12-38 | 25-8-45 | 273 | 28·5 | 10,510 | 6·48 | 681·73 | Miss L. G. Hancock . | Austral Park Wonderful Standard (12423) |
| Camden Circe .... .... | Jersey | 80637 | 24 9-39 | 9-10-44 | 273 | 18 | 9,234 | 6·93 | 640·20 | C. E. Kruger ... | Greenmount Golden Sultan (14688) |
| Congelin Rosemarie 6th .... | Jersey | 80830 | 14-4-40 | 9-6-45 | 273 | 14 | 9,267 | 6·20 | 575·07 | D. Bradford ... | Rosecliffe Marchalong (15094) |
| **SENIOR FOUR YEAR OLDS—STANDARD 330 LB. BUTTERFAT.** | | | | | | | | | | | |
| Juadine Queen .... .... | Jersey | 87022 | 20-5-40 | 1-2-45 | 273 | 29·5 | 8,968 | 6·37 | 571·69 | Miss L. G. Hancock | Austral Park Wonderful Standard (12423) |
| Grass Vale Lady Fowler 31st | Jersey | 81634 | 17 8-40 | 6-5-45 | 273 | 23 | 9,069 | 5·31 | 481·94 | R. H. Rose & Son . | Grass Vale Gold Boy (14684) |
| Koojan Golden Jewel .... | Guernsey | 8805 | 12-3-40 | 21-1-45 | 273 | 18 | 7,134 | 6·07 | 433·22 | A. W. Padbury . . | Koojan Beau Ideal (4965) |
| **JUNIOR FOUR YEAR OLDS—STANDARD 310 LB. BUTTERFAT.** | | | | | | | | | | | |
| Koojan Ideal's Judith . | Guernsey | 10696 | 24-6-40 | 19-12-44 | 273 | 15 | 8,145 | 5·34 | 435·68 | A. W. Padbury | Glenburnie Ideal (Imp.) (2548) |
| Grass Vale Lady Fowler 32nd | Jersey | 86644 | 11 6-41 | 5-8-45 | 273 | 16 | 8,178 | 5·31 | 434·71 | R. H. Rose & Son | Mornmoot Northwood Beau (17798) |
| Carbanup Dora .... .... | A.I.S. | 35388 | 1-4-41 | 25-6-45 | 273 | 9·5 | 11,531 | 3·72 | 429·61 | D. H. Bell .... . . | Glanavon Maestro |
| **SENIOR THREE YEAR OLDS—STANDARD 290 LB. BUTTERFAT.** | | | | | | | | | | | |
| Juadine Peerless Lily 19th . . . | Jersey | . | 26-10-41 | 20-5-45 | 273 | 23 | 8,039 | 6·27 | 503·05 | Miss L. G. Hancock . | Austral Park Wonderful Standard (12423) |
| Grass Vale Golden Cream 25th | Jersey | .... | 7-5-41 | 5-5-45 | 273 | 15 | 7,425 | 6·12 | 455·14 | R. H. Rose & Son . . . | Grass Vale Gold Boy (14684) |
| Grass Vale Lady Fowler 33rd | Jersey | .... | 7-7-41 | 6-5-45 | 273 | 20 | 8,220 | 5·51 | 453·06 | R. H. Rose & Son . . | Mornmoot Northwood Beau (17798) |

JUNIOR THREE YEAR OLDS—STANDARD 270 LB. BUTTERFAT.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grass Vale Northwood Eve | Jersey | | 3-7-42 | 2-9-45 | 273 | 27 | 11,511 | 5·69 | 655·15 | R. H. Rose & Son | Mornmoot Northwood Beau (17798) |
| Juadine Peerless Lily 20th | do. | | 10-12-41 | 4-5-45 | 273 | 27 | 8,976 | 6·10 | 547·67 | Miss L. G. Hancock | Austral Park Wonderful Standard (12423) |
| Grass Vale Lady Fowler 35th | do. | | 1-3-42 | 23-6-45 | 273 | 14 | 7,182 | 5·97 | 428·86 | R. H. Rose & Son | Mornmoot Northwood Beau (17798) |

SENIOR TWO YEAR OLDS—STANDARD 250 LB. BUTTERFAT.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Koojan Ace's Gladsome | Guernsey | | 24-3-43 | 29-9-45 | 273 | 34 | 8,982 | 5·01 | 450·72 | A. W. Padbury | Homestead Ace (Imp.) (1631) |
| Grass Vale Lady Fowler 36th | Jersey | | 28-5-42 | 20-5-45 | 273 | 21 | 7.788 | 5·72 | 445·41 | R. H. Rose & Son | Grass Vale Gold Boy (14684) |
| Koojan Ideal's Noblemark's Bo Peep | Guernsey | | 19-12-42 | 31-8-45 | 273 | 30 | 8,610 | 5·02 | 432·31 | A. W. Padbury | Koojan Ideal's Noblemark (5949) |

JUNIOR TWO YEAR OLDS—STANDARD 230LB. BUTTERFAT.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grass Vale Magnolia 5th | Jersey | | 16-10-43 | 1-10-45 | 273 | 23 | 7,269 | 5·82 | 423·48 | R. H. Rose & Son | Grass Vale Gold Cup |
| Grass Vale Golden Cream 26th | do. | | 3-8-43 | 19-6-45 | 273 | 15 | 6.315 | 6·07 | 383·86 | R. H. Rose & Son | Mornmoot Northwood Beau (17798) |
| Grass Vale Buttercup 14th | do. | | 7-9-43 | 2-10-45 | 273 | 17 | 6,441 | 5·93 | 382·00 | R. H. Rose & Son | Grass Vale Gold Cup |

TABLE 9.

COWS WHICH COMPLETED TEST DURING THE TWELVE MONTHS ENDED 30TH JUNE, 1946.

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight of Milk Last Day of Test. lb. | Weight of Milk for Period. lb. | Average Test. % | Weight of Butter Fat for Period. lb. | Owner. | Sire. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| COWS UNDER 2½ YEARS—STANDARD 230 LB BUTTER-FAT. | | | | | | | | | | | |
| Grass Vale Magnolia 5th | Jersey | .... | 16-10-43 | 1-10-45 | 273 | 23 | 7,269 | 5·82 | 423·48 | R. H. Rose & Son | Grass Vale Gold Cup |
| Grass Vale Golden Cream 26th | Jersey | .... | 3 8-43 | 19-6-45 | 273 | 15 | 6,315 | 6·07 | 383·86 | R. H. Rose & Son | Mornmoot Northwood Beau (17798) |
| Grass Vale Buttercup 14th | do. | .. | 7-9-43 | 2-10-45 | 273 | 17 | 6,441 | 5·93 | 382·00 | R. H. Rose & Son | Grass Vale Gold Cup |
| Lansdowne Magnificent | Guernsey | .... | 17-3-43 | 10-9-45 | 273 | 26 | 7,578 | 4·81 | 264·77 | J. R. Giles | Lansdowne Ferdinand's Polygamous (5966) |
| Juadine Peerless Lily 21st | Jersey | .... | 5-9-42 | 2 12-44 | 273 | 10·5 | 5,236 | 6·86 | 359·29 | Miss L. G. Hancock | Austral Park Wonderful Standard (12423) |
| Mayvale Discover's Bluebell 2nd | Guernsey | .... | 24-9-43 | 24-9-45 | 273 | 14 | 6,072 | 5·87 | 356·71 | R. J. Giles | Koojan Ideal's Discover (4968) |
| Denmark Bonnie Princess | do. | .... | 28 11-42 | 30-4-45 | 273 | 18·5 | 7,300 | 4·73 | 345·65 | Denmark Research Station | Koojan Ideal's Reflection (4974) |
| Lansdowne Ideal's Pride | do. | .. | 9-1-43 | 6-4-45 | 273 | 20 | 5,430 | 6·33 | 343·98 | J. R. Giles | Koojan Beau Ideal (4965) |
| Carbanup Florence | A.I.S. | .... | 13-2-43 | 7-8-45 | 273 | 22 | 8,991 | 3·81 | 343·17 | D. H. Bell | Glanavon Maestro (4833) |
| Carbanup Fuchsia | do. | .... | 16-2-43 | 15 7 45 | 273 | 6 | 9,093 | 3·69 | 336·44 | D. H. Bell | Newstead Royal Sun (7252) |
| Carbanup Fragrance | do. | ... | 10-2 43 | 22-6 45 | 273 | 11·5 | 8,104 | 4·13 | 334·85 | D. H. Bell | Newstead Royal Sun (7252) |
| Claremont Clara 19th | do. | . | 7-9-42 | 16-1 45 | 273 | 30 | 8,580 | 3·88 | 336·16 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Claremont Biddy 65th | do. | .... | 13 9 42 | 26-12-44 | 273 | 32 | 8,196 | 4·05 | 332·55 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Claremont Maggie Morrison 48th | do. | .. | 6-8-42 | 23-10-44 | 273 | 32 | 8,406 | 3·88 | 326·93 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Juadine Fairy | Jersey | .... | 12 6-43 | 5 6 45 | 273 | 9 | 4,752 | 6·76 | 326·66 | Miss L. G. Hancock | Juadine Northwood Beau (19679) |
| Koojan Ace's Diplomat | Guernsey | .. | 28-8-43 | 23 8-45 | 273 | 22 | 5,976 | 5·44 | 325·38 | A. W. Padbury | Homestead Ace (1631) |
| Claremont Mabel 26th | A.I.S. | .. | 23-11 42 | 23-2-45 | 273 | 29 | 9,842 | 3·28 | 324·38 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Claremont Poppy 27th | do. | .. | 22-9-42 | 8 11-45 | 273 | 27 | 8,271 | 3·91 | 323·72 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Claremont Maggie Morrison 49th | do. | .... | 26-8-42 | 26 10 44 | 273 | 26 | 7,818 | 4·11 | 321·58 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Grass Vale Design's Noella | Jersey | .. | 20 10-43 | 26-9-45 | 273 | 16 | 5,868 | 5·45 | 320·28 | R. H. Rose & Son | Mornmoot Northwood Beau (17798) |
| Claremont Whitby Maid 51st | A.I.S. | .... | 30-8-42 | 29 10-44 | 273 | 30 | 8,100 | 3·88 | 314·68 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Eangella Faline | Jersey | .. | 4-5-43 | 17 5-45 | 273 | 15 | 5 790 | 5·42 | 313·96 | D. G. Spark | Travalgon Starbright King (18129) |
| Claremont Fancy 13th | A.I.S. | .... | 23-11-42 | 4 4-45 | 273 | 28 | 8,184 | 3·78 | 309·61 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Eungella Telopia | Jersey | . | 20 5-43 | 3 7 45 | 273 | 12 | 5,016 | 6·16 | 309·37 | D. G. Spark | Travalgon Starbright King (18129) |
| Carbanup Florrie | A.I.S. | .. | 25-6 43 | 9 7 45 | 273 | 13 | 8,919 | 3·43 | 306·05 | D. H. Bell | Glanavon Maestro (4833) |
| Claremont Cherry 24th | do. | . | 20-3-41 | 21 6-43 | 273 | 26 | 7,908 | 3·82 | 302·79 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Mayvale Diana 2nd | Guernsey | .... | 9 8 43 | 8 9 45 | 273 | 19 | 6,357 | 4·73 | 301·16 | R. J. Giles | Koojan Ideal's Discoverer (4968) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Claremont Fancy 12th .... | A.I.S. | .... | 24-7-42 | 20-10-44 | 273 | 26 | 7,668 | 3·87 | 296·93 | Claremont Hospital for Insane | Westby Masterpiece (5403) |
| Tipperary Fairy 9th .... | do. | .... | 27-9-42 | 22-12-44 | 273 | 19 | 6,597 | 4·47 | 295·22 | W. G. Burges .... | Tipperary Ace (6336) |
| Carbanup Floxy .... .... | do. | .... | 19-2 43 | 21 6 45 | 273 | 7 | 7,881 | 3·78 | 293·96 | D. H. Bell .... .... | Newstead Royal Sun (7252) |
| Claremont Maggie Morrison 51st | do. | .... | 28-9-42 | 25 1-45 | 273 | 26 | 7,368 | 3·96 | 292·37 | Claremont Hospital for Insane | Westby Masterpiece (5403) |
| Tipperary Beauty 15th .... | do. | .... | 15-10-42 | 27-11-44 | 273 | 20 | 6,810 | 4·28 | 291·84 | W. G. Burges .... | Tipperary Ace (6336) |
| Wooroloo Patsy 2nd .... | do. | .... | 3-8-43 | 26-9-45 | 273 | 19 | 6,537 | 4·44 | 290·27 | Wooroloo Santorium Farm | Berry Rufus 2nd (6570) |
| Claremont Maggie Morrison 50th | do. | .... | 25-9-42 | 29-2-45 | 273 | 18 | 7,284 | 3·98 | 290·08 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Lansdowne Iolanthe .... | Guernsey | .... | 23-10-42 | 26-4-45 | 273 | 14 | 5,492 | 5·26 | 289·30 | P. G. Hampshire & Son | Yarraview Clarinet 2nd (4629) |
| Claremont Pinafore 16th .... | A.I.S. | .... | 10-9-42 | 6-1-45 | 273 | 20 | 7,500 | 3·84 | 288·12 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Claremont Star 32nd .... | do. | .... | 11 10 42 | 26 1-45 | 273 | 28 | 7,554 | 3·76 | 384·61 | Claremont Hospital for Insane | Westby Masterpiece (5403) |
| Claremont Beanie 12th .... | do. | .... | 5-8-42 | 23-10 44 | 273 | 23 | 7,089 | 4·00 | 283·86 | Claremont Hopital for Insane | Westby Monarch (5404) |
| Claremont Biddy 66th .... | do. | .... | 23 9-42 | 24 1 45 | 273 | 19 | 7,002 | 4·02 | 281·87 | Claremont Hospital for Insane | Westby Masterpiece (5403) |
| Claremont Blossom 42nd .... | do. | .... | 29 8-42 | 26 10-44 | 273 | 28 | 6,864 | 4·09 | 281·03 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Glanavon Spangle 3rd .... | do. | 36583 | 1-9-42 | 16-11-44 | 273 | 21·5 | 6,285 | 4·39 | 278·76 | W. G. Burges .... | Blacklands Monarch's Commander (1877) |
| Wooroloo Gail .... .... | do. | .. . | 28-2 43 | 26-2-45 | 273 | 24 | 6,282 | 4·42 | 278·09 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Juadine March Flower 2nd .... | Jersey | .... | 30-9-43 | 4-9-45 | 240 | 12 | 4,650 | 5·93 | 276·15 | Miss L. G. Hancock .... | Juadine Northwood Beau (17798) |
| Camden Charmaine .... .... | do. | .... | 11-7-43 | 28 7-45 | 273 | 5·5 | 4,906 | 5·61 | 275·36 | Mrs. A. G. Eckersley . .. | Greenmount Golden Bobbie (18578) |
| Kapara Viola .... .... | do. | .. . | 27 4-43 | 28 8-45 | 273 | 7·5 | 5,182 | 5·30 | 274·80 | D. Bradford .... .. | Congelin Mandarin (14542) |
| Claremont Belle 32nd .... | A.I.S. | .... | 8 8-42 | 23-10-44 | 273 | 23 | 6,459 | 4·24 | 274·15 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Claremont Beauty 25th .... | do. | .... | 17-12 42 | 27-5-45 | 273 | 24 | 6,912 | 3·96 | 273·74 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Claremont Beauty 26th .... | do. | .... | 23 6 43 | 28-8 45 | 273 | 10 | 7,050 | 3·87 | 273·23 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Brookfield's Isobel . .. .... | Guernsey | . .. | 15 4 43 | 7 10 45 | 273 | 7·5 | 5,527 | 4·89 | 270·29 | P. G. Hampshire & Son | Yarraview Julian (4634) |
| Claremont Maggie Morrison 53rd | A.I.S. | .... | 1-2-43 | 12-6-45 | 273 | 23 | 6,669 | 4·03 | 269·02 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Wattlecreek Stella .... .... | do. | .... | 22-9-42 | 23-10-44 | 273 | 24 | 6,732 | 3·98 | 268·45 | E. T. Thatcher .... | Wattlecreek Duchess's Monarch (5399) |
| Claremont Whitby Maiden 3rd | do. | .... | 3-11-42 | 12-1-45 | 273 | 21 | 6,993 | 3·81 | 266·57 | Claremont Hospital for Insane | Westby Masterpiece (5403) |
| Carbanup Floss .... .... | do. | .... | 22 4 43 | 23-7-45 | 273 | 7 | 7,296 | 3·56 | 260·14 | D. H. Bell .... .... | Newstead Royal Sun (7252) |
| Carbanup Freda .... .... | do. | .... | 8-7-43 | 25-7-45 | 273 | 4·5 | 6,928 | 3·74 | 259·23 | D. H. Bell .... .... | Newstead Royal Sun (7252) |
| Travalgon Starbright 21st .... | Jersey | .... | 27-5 43 | 15-6-45 | 273 | 12 | 4,221 | 6·13 | 258·80 | W. H. & T. F. Robinson | Orphanage Cuba (17913) |
| Tipperary Lovely 6th .... | A.I.S. | .... | 14-9-42 | 23-11-44 | 273 | 18 | 6,324 | 4·08 | 258·53 | W. G Burges .... | Tipperary Ace (6336) |
| Claremont Cherry 29th .... | do. | .... | 3-6-42 | 20-10-44 | 273 | 20 | 6,135 | 4·20 | 258·09 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Crantock Fancy Bonnette .... | Jersey | .... | 18-4-43 | 18-3-45 | 273 | 16·5 | 4,939 | 5·09 | 251·83 | Mrs. G. H. Burnside | Werribee David (18183) |
| Radyr Park Coon's Coronation's Estrellita 5th | do. | .... | 1-8-43 | 6-10-45 | 273 | 12 | 4,176 | 6·02 | 251·59 | L. M Temple .... | Navua September Lad (14023) |
| Brookfield's Faith 13th .... | Guernsey | .... | 26-9-43 | 14-9-45 | 273 | 10 | 4,695 | 5·32 | 249·98 | P. G. Hampshire & Son | Yarraview Julian (4634) |

**TABLE 9—HERD TESTING**—continued.

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight of Milk Last Day of Test. lb. | Weight of Milk for Period. lb. | Average Test. % | Weight of Butter Fat for Period. lb. | Owner. | Sire. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| COWS UNDER 2½ YEARS—STANDARD 230 LB BUTTER-FAT—*continued.* | | | | | | | | | | | |
| Korigekup Loyal Lady .... | Jersey | .... | 25-2-43 | 24-6-45 | 273 | 8 | 5,214 | 4·75 | 248·01 | Mrs. A. G. Eckersley .... | Navua Royal Star (15869) |
| Travalgon Lady Eion 17th | do. | .... | 29-5-43 | 17-7-45 | 273 | 11 | 4,248 | 5·81 | 247·13 | W. H. & T. F. Robinson | Orphanage Douglas (18919) |
| Lansdowne Pollyanna 2nd ... | Guernsey | 10725 | 16-9-42 | 25-12-44 | 210 | 16 | 4,080 | 5·97 | 243·60 | J. R. Giles .... .... | Koojan Beau Ideal (4965) |
| Camden Selena .... .... | Jersey | .... | 28-9-43 | 21-6-45 | 273 | 11 | 4,338 | 5·60 | 243·00 | D. G. Spark .... .... | Greenmount Golden Bobbie (18578) |
| Wooroloo Hilda .... .... | A.I.S. | .... | 27-12-42 | 25-12-44 | 273 | 20 | 5,835 | 4·15 | 242·71 | Woorlooo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Crantock Masterpiece's Maptionette | Jersey | .... | 3-5-43 | 26-7-45 | 240 | 7 | 4,830 | 4·98 | 240·84 | Mrs. G. H. Burnside .... | Crantock Napoleon's Masterpiece (14550) |
| Travalgon Starbright 20th .... | do. | .... | 15-4-43 | 13-7-45 | 273 | 13 | 4,104 | 5·78 | 237·32 | W. H. & T. F. Robinson | Orphanage Cuba (17913) |
| Camden Celeste .... .... | do. | .... | 10-9-43 | 9-4-45 | 273 | 10 | 3,705 | 6·33 | 234·60 | D. G. Spark .... .... | Greenmount Golden Bobbie (18578) |
| Wattlecreek Scarlet .... | A.I.S. | .... | 16-8-42 | 7-10-44 | 273 | 16 | 5,508 | 4·23 | 233·31 | E. T. Thatcher .... | Wattlecreek Duchess's Monarch (5399) |
| Kapara Bo-Peep .... .... | Jersey | .... | 17-5-43 | 17-7-45 | 273 | 9 | 4,617 | 4·91 | 226·88 | D. Bradford .... .... | Congelin Jolly Eminent 3rd (82073) |
| Brookfield's Ballet Girl .... | Guernsey | .... | 12-10-42 | 16-1-45 | 273 | 23·5 | 5,335 | 5·24 | 226·73 | P. G. Hampshire & Son | Yarraview Clarinet (4629) |
| Claremont Biddy 72nd .... | A.I.S | .... | 24-8-43 | 25-9-45 | 273 | 17 | 5,721 | 3·94 | 225·61 | Claremont Hospital for Insane | Westby Masterpiece (5403) |
| Juadine Lily .... .... .... | Jersey | .... | 12-2-43 | 8-6-45 | 273 | 10 | 4,070 | 5·52 | 224·83 | Mrs. A. G. Eckersley | Austral Park Wonderful Standard (12423) |
| Travalgon Starbright 24th .... | do. | .... | 12-8-43 | 12-7-45 | 273 | 13 | 4,004 | 5·09 | 224·49 | W. H. & T. F. Robinson | Orphanage Douglas (18919) |
| Wooroloo Emerald .. .... | A.I.S. | .... | 30-11-42 | 18-12-44 | 273 | 15 | 4,965 | 4·51 | 224·19 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Glanavon Doris 15th .... | do. | .... | 21-10-42 | 15-2-45 | 273 | 23 | 5,379 | 4·15 | 223·40 | D. Bevan & Sons .... | Blackland Monarch's Commande (1877) |
| Lansdowne Bonny Elizabeth | Guernsey | .... | 1-6-42 | 11-11-44 | 273 | 7 | 3,956 | 5·62 | 222·55 | J. R. Giles .. .. ... | Koojan Beau Ideal (49645) |
| Claremont Poppy 29th .... | A.I.S. | .... | 16-3-43 | 8-6-45 | 273 | 15 | 5,475 | 4·06 | 222·51 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Claremont Lily 11th .... | do. | .... | 3-1-43 | 9-4-45 | 273 | 18 | 5,574 | 3·97 | 221·54 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Travalgon Starbright 23rd .... | Jersey | .. | 27-6-43 | 11-8-45 | 240 | 13 | 3,750 | 5·55 | 208·20 | W. H. & T. F. Robinson | Orphanage Douglas (18919) |
| Travalgon Lady Eion 18th .... | do. | .... | 30-5-43 | 14-7-45 | 273 | 8 | 3,249 | 6·10 | 198·36 | W. H. & T. F. Robinson | Orphanage Cuba (17913) |
| Wattle Creek Rene .... .... | A.I.S. | .... | 21-8-43 | 20-6-45 | 273 | 15 | 5,175 | 3·82 | 198·14 | E. T. Thatcher .... | Glanavon Duncan |
| Narrogin Marrion .... .... | do. | .... | 10-6-43 | 12-4-45 | 273 | 12 | 4,851 | 4·07 | 197·14 | Narrogin School of Agriculture | Tipperary Amy's Mascot (6338) |
| Muresk's Delicia's Pride .... | Guernsey | .... | 11-6-43 | 9-6-45 | 273 | 11 | 4,203 | 4·66 | 196·01 | Muresk Agricultural College | Koojan Ace Warspite (5943) |
| Carbanup Fussy .... .... | A.I.S | .... | 22-8-43 | 1-8-45 | 240 | 2 | 5,055 | 3·87 | 195·87 | D. H. Bell .... .... | Glanavon Maestro (4833) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Denmark Orange Pekette ... | Guernsey | .... | 12-6-43 | 28-6 45 | 273 | 6 | 4,443 | 4·37 | 194·38 | Denmark Research Station | Koojan Ideal's Reflection (4974) |
| Muresk Gay .... .... .... | do. | .... | 29-3-43 | 29-8 45 | 273 | 10 | 3,630 | 5·26 | 191·30 | Muresk Agricultural College | Koojan Ideal's Dictator (4167) |
| Wooroloo Lucky .... .... | A.I.S | .... | 4-8-43 | 27 9-45 | 240 | 8 | 4,170 | 4·35 | 181·80 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Kapara Fire-fly .... .... | Jersey | .... | 11-8-43 | 2 9-45 | 180 | 15 | 3,960 | 4·48 | 177·75 | D. B. Radford .... | Congelin Mandarin (14542) |
| Travalgan Lady Mint 9th .... | do. | .... | 28-7 43 | 24 6-45 | 273 | 5 | 3,360 | 5·19 | 174·50 | W. H. T. F. Robinson | Orphanage Douglas (18919) |
| Narrogin Flo .... .... | A.I.S. | .... | 6 4-43 | 15-5-45 | 240 | 11 | 5,670 | 3·06 | 173·73 | Narrogin School of Agriculture | Tipperary Amy's Mascot (6338) |
| Travalgan Starbright 22nd | Jersey | .... | 18-6-43 | 17 6-45 | 273 | 9 | 3,147 | 5·46 | 171·97 | W. H. & T. F. Robinson | Travalgan Oxford's King (19160) |
| Wattle Creek Rivette .... | A.I.S. | .... | 23-9-42 | 4-11-44 | 210 | 13 | 3,840 | 3·92 | 150·90 | E. T. Thatcher . | Wattle Creek Duchess's Monarch (5399) |
| Denmark Reflections' Dame | Guernsey | .. | 15-2 43 | 30 4-45 | 240 | 6·5 | 3,345 | 4·44 | 148·83 | Denmark Research Station | Koojan Ideal's Reflection (4974) |
| Glanavon Charmer 3rd .. | A.I.S. | .. | 29-12-42 | 9-1-45 | 240 | 14 | 3,480 | 4·01 | 139·89 | D. Bevan Sons .... | Blackland's Jean's Supreme (1871) |
| Narrogin Dora .... .... | do. | .. | 1-7-43 | 17-5-45 | 210 | 6·5 | 3,435 | 3·86 | 132·81 | Narrogin School of Agriculture | Tipperary Amy's Mascot (6338) |
| Lenmoor's Rosy .... .. | do. | .... | 18-8-43 | 11-10-45 | 180 | 10 | 3,480 | 3·67 | 127·86 | W. K. Barnes .... | Ferndale Radiant (5729) |
| Glanavon Melba 6th .... | do. | .... | 22-12-42 | 17-1-45 | 240 | 14 | 3,030 | 4·04 | 122·52 | D. Bevan Sons .. | Glanavon Federal (6869) |
| Lenmoor's Roma .... .... | do. | .. | 16-8-43 | 16-10-45 | 180 | 6 | 3,090 | 3·76 | 116·46 | W. K. Barnes .. | Ferndale Radiant (5729) |
| Juadine Julienne 3rd .. | Jersey | .. | 19 8-43 | 18-8-45 | 90 | 22 | 2,025 | 5·45 | 110·49 | B. Langridge .. | Juadine Northwood Beau (19679) |
| Crantock Fancy Primula .... | do. | .. | 7-12-43 | 13-2-46 | 60 | 18 | 1,230 | 4·49 | 55·26 | Mrs. G. H. Burnside | Werribee David (18183) |
| Radyr Park Dorothy 24th .... | do. | . | 28-3-44 | 21-3-46 | 60 | 13 | 870 | 5·20 | 45·27 | L. M. Temple .. | Navua September Lad (14023) |
| Sarsden Gem .... .... | A.I.S. | .. | 6 10-43 | 27-2-46 | 60 | 20·5 | 1,425 | 2·94 | 41·94 | W. K. Barnes .. | Tipperary Kitty's Commander (5332) |
| Crantock Fancy Times .... | Jersey | .. | 24 8 43 | 27-2 46 | 30 | 16 | 480 | 4·11 | 19·83 | Mrs. G. H. Burnside .... | Werribe David (18183) |
| Horsford Camelia 12th .... | A.I.S. | .... | 22-4-44 | 14-5 46 | 30 | 20·5 | 615 | 3·21 | 19·77 | W. K. Barnes ... | Wooroloo Red Lad (5418) |

COWS 2½ YEARS AND UNDER 3 YEARS—STANDARD 250LB. BUTTER-FAT.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Koojan Ace's Gladsome .... | Guernsey | .. | 24-3-43 | 29-9-45 | 273 | 34 | 8,982 | 5·01 | 450·72 | A. W. Padbury . | Homestead Ace (Imp.) (1631) |
| Grass Vale Lady Fowler 56th | Jersey | . | 28-5-42 | 20-5-45 | 273 | 21 | 7,788 | 5·72 | 445·41 | R. H. Rose & Son . | Grass Vale Gold Boy (14684) |
| Koojan Ideal's Noblemarks' Bo-Peep | Guernsey | .. | 1-12-42 | 31-8 45 | 273 | 30 | 8,610 | 5·02 | 432·31 | A. W. Padbury . | Koojan Ideal's Noblemark (5949) |
| Westlawn Gentle .... .... | A.I.S | .. | 5-9-42 | 29 5-45 | 273 | 23 | 10,299 | 3·79 | 390·77 | Mrs. E. L. Brockman | Glanavon Pilot (5747) |
| Lansdowne Ideal's Joybell ... | Guernsey | .. | 21 11-42 | 15 6-45 | 273 | 22 | 7,206 | 5·22 | 361·95 | J. R. Giles .. . | Koojan Beau Ideal (4965) |
| Koojan Ace's Diahtnus ... | do. | 10687 | 29-6-42 | 27-3-45 | 273 | 21 | 6,183 | 5·55 | 343·69 | A. W. Padbury . | Homestead Ace (Imp.) (1631) |
| Wooroloo Deana .... .... | A.I.S. | .. | 16 12-42 | 8 9-45 | 273 | 20 | 7,620 | 4·37 | 333·47 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Wooroloo Wynette .... .. | do. | 41212 | 2 4-42 | 12 3-45 | 273 | 13 | 7,539 | 4·24 | 319·77 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Travalgon Starbright 19th ... | Jersey | .... | 7-6-42 | 23-5-45 | 273 | 13 | 5.844 | 5·34 | 312·33 | W. H. & T. F. Robinson | Orphanage Douglas (18919) |
| Denmark Reflectionette .... | Guernsey | .. | 15-11-42 | 6-6-45 | 273 | 15 | 6,225 | 4·86 | 303·13 | Denmark Research Station | Koojan Ideal's Reflcetion (4974) |
| Claremont Belle 5th .... | A.I.S. | . | 26-11-42 | 10-6 45 | 273 | 26 | 7,758 | 3·90 | 302·70 | Claremont Hospital for Insane | Westby Masterpiece (5403) |
| Wooroloo Gwen 2nd . | do. | 41185 | 1-2-42 | 2 1-45 | 273 | 20 | 6.970 | 4·24 | 296·13 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Lansdowne Ideal's Dainty | Guernsey | ... | 22-2-43 | 7 9-45 | 273 | 23·5 | 6,100 | 4·83 | 294·67 | J. R. Giles .. .. | Koojan Beau Ideal (4965) |

**TABLE 9—HERD TESTING—continued.**

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight of Milk on Last Day of Test. lb. | Weight of Milk for Period. lb. | Average Test. % | Weight of Butter-Fat for Period. lb. | Owner. | Sire. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| COWS 2½ YEARS AND UNDER 3 YEARS—STANDARD 250 LB BUTTER-FAT—*continued.* | | | | | | | | | | | |
| Wattle Creek Rivette .... | A.I.S. | .... | 23-9-42 | 13-9-45 | 273 | 12 | 7,326 | 3·98 | 291·62 | E. T. Thatcher .... | Wattle Creek Duchess's Monarch (5399) |
| Kapara Sparkle's Lassie .. | Jersey | .... | 14-10-42 | 12-6-45 | 273 | 15 | 6,000 | 4·82 | 289·72 | D. Bradford .... .... | Congelin Jolly Eminent 3rd (18425) |
| Crantock Fancy Socks .... | do. | .... | 15-7-42 | 9-6-45 | 273 | 11 | 5,898 | 4·99 | 284·27 | Mrs. G. H. Burnside .... | Werribee David (18183) |
| Wooroloo Greta .... .... | A.I.S. | .... | 20-12-42 | 15-7-45 | 273 | 18 | 6,384 | 4·41 | 282·10 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Colmyn Express .... .... | Jersey | .... | 9-9-42 | 12-7-45 | 240 | 5 | 5,175 | 5·28 | 273·48 | Mrs. C. H. Ironmonger | Greenmount Cream Lad (18577) |
| Wooroloo Lady May 4th .... | A.I.S. | .... | 13-2-43 | 31-8-45 | 273 | 16 | 5,898 | 4·58 | 270·25 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Wooroloo Lady May 2nd .... | do. | 41195 | 2 3-42 | 26-12 44 | 273 | 23 | 6,069 | 4·43 | 268·92 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Wooroloo Red Lady .... | do. | 41203 | 6-3-42 | 25-12-44 | 273 | 16 | 6,138 | 4·33 | 266·07 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Travalgon Lady Eion 15th .... | Jersey | .... | 25-7-42 | 17-6-45 | 273 | 11 | 4,743 | 5·41 | 256·88 | W. H. & F. T. Robinson | Orphanage Douglas (18919) |
| Claremont Treasure 36th .... | A.I.S. | .... | 10-12-42 | 19-6 45 | 273 | 20 | 6,420 | 3·94 | 252·49 | Claremont Hospital for Insane | Summerlea Churchill (6236) |
| Claremont Hilda 14th .... | do. | .... | 20 10 42 | 1-5-45 | 273 | 19 | 6,087 | 4·11 | 250·34 | Claremont Hospital for Insane | Westby Monarch (5404) |
| Wooroloo Rene 2nd .... | do. | .... | 1-3-42 | 26-12 44 | 273 | 18 | 5,814 | 4·27 | 248·42 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Glenavon Rene 2nd .... | do. | .... | 16-10-42 | 18-5-45 | 273 | 22 | 6,111 | 4·02 | 246·19 | D. Bevan & Sons .... | Glanavon Federal (6869) |
| Travalgon Lady Eion 16th .... | Jersey | .... | 3 9-42 | 9-6 45 | 273 | 12 | 4,446 | 5·51 | 245·29 | W. H. & T. F Robinson | Glen Iris Golden Oxford (12694) |
| Wooroloo Jessie .... .... | A.I.S. | 41191 | 4-3-42 | 17-12-44 | 273 | 14 | 5,592 | 4·22 | 236·51 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Wooroloo Doreen 5th .... | do. | 41176 | 22-3-42 | 22-3-45 | 240 | 15 | 5,310 | 4·35 | 231·36 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Brookfied's Morden Lady 6th | Guernsey | 10072 | 24 5-42 | 24-5-45 | 273 | 6·5 | 3,784 | 5·67 | 214·78 | P. G. Hampshire & Son | Yarraview Clarinet 2nd (4629) |
| Kaparal Duchess .. .. | Jersey | .... | 14 9-42 | 2 7-45 | 273 | 2 | 3,756 | 5·58 | 209·77 | D. Bradford .. | Congelin Mandarin (14542) |
| Narrogin Sally .. .. .... | A.I.S. | .. . | 26 4-42 | 18-4 45 | 240 | 11 | 4,890 | 4·22 | 206·30 | Narrogin School of Agriculture | Tipperary Amy's Mascot (6338) |
| Wattle Creek Vida .... .... | do. | .... | 9-8-42 | 1-8-45 | 210 | 7 | 5,630 | 3·65 | 205·86 | E. T. Thatcher .... | Wattle Creek Duchess's Monarch (5399) |
| Wattle Creek Bertha .... | do. | .. | 5-12-42 | 8-10 45 | 210 | 7 | 4,980 | 3·99 | 199·02 | E. T. Thatcher .... | Wooroloo Royal Standard (6414) |
| Narrogin Doreen .... .... | do. | .... | 13-8-42 | 17-4-45 | 273 | 9·5 | 5,233 | 3·71 | 194·13 | Narrogin School of Agriculture | Tipperary Amy's Mascot (6338) |
| Radyr Park Dorothy 19th .... | Jersey | .... | 16-3 42 | 12-12 44 | 240 | 12·5 | 4,110 | 4·63 | 190·65 | L. M. Temple .... | Navua Coronation Star (14929) |
| Claremont Biddy 71st .... | do. | .... | 18-12-42 | 4 9 45 | 240 | 12 | 4,770 | 3·62 | 173·10 | W. K. Barnes .. | Westby Monarch (5404) |
| Travalgon Lady Eion 14th .... | Jersey | .... | 11-6-42 | 24-5-45 | 273 | 6 | 2,838 | 5·54 | 157·36 | W. H. & T. F. Robinson | Travalgon Oxford's King (19160) |
| Narrogin Dainty .... .... | A.I.S. | .... | 2-5-42 | 24-4-45 | 180 | 6 | 2,925 | 5·27 | 151·86 | Narrogin School of Agriculture | Westby Masterpiece (5403) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Radyr Park Dorothy 21st .... | Jersey | .... | 23-3-43 | 13-12-45 | 180 | 9·5 | 2,825 | 4·72 | 133·56 | L. M. Temple .... | Navua September Lad (14023) |
| Plenarbor Hetty .... .... | A.I.S. | .... | 6-1-43 | 23-11-45 | 210 | 6 | 2,925 | 4·53 | 132·57 | Mrs. V. Alexander ... | Glanavon Genius (3957) |
| Muresk Dame Enid .... | Guernsey | .... | 17-5-42 | 19-2-45 | 273 | 7 | 2,391 | 5·13 | 122·85 | Muresk Agricultural College | Muresk Arthur (4338) |
| Glanavon Dahlia 18th .... | A.I.S. | .... | 8-2-43 | 5-10-45 | 180 | 7 | 2,667 | 4·19 | 111·81 | D. Bevan & Sons .... | Blackland's Monarch's Commander (1877) |
| Juadine Nancy 2nd .... | Jersey | .... | 26-9-42 | 3-9-45 | 60 | 21 | 1,350 | 8·13 | 109·86 | B. Langridge .... | Austral Park Wonderful Standard (12423) |
| Denmark Golden Velvet .... | Guernsey | .... | 1-6-43 | 13-12-45 | 150 | 11·5 | 2,355 | 4·35 | 102·57 | Denmark Research Station | Koojan Ideal's Reflection (4974) |
| Glanavon Gold 5th .... .... | A.I.S. | .... | 10-3-42 | 16-2-45 | 150 | 12 | 2,475 | 3·98 | 98·58 | D. Bevan & Sons .. | Newstead Triumph (3420) |
| Glanavon Gold 6th .... .... | do. | .... | 6-1-43 | 22-8-45 | 60 | 33 | 2,040 | 3·79 | 77·49 | D. Bevan & Sons . | Newstead Triumph (3420) |
| Grass Vale Buttercup 11th .... | Jersey | .... | 5-7-42 | 8-4-45 | 30 | 40 | 1,200 | 5·20 | 62·46 | R. H. Rose & Son .... | Mornmoot Northwood Beau (17798) |
| Grassvale Lady Fowler 38th | Jersey | .... | 1-9-42 | 20-6-45 | 30 | 26 | 780 | 4·87 | 38·04 | R. H. Rose & Son .... | Mornmoot Northwood Beau (17798) |
| Muresk Mayfus .... .... | Guernsey | .... | 9-1-43 | 11-8-45 | 60 | 9 | 660 | 4·36 | 28·83 | Muresk Agricultural College | Koojan Ideal's Dictator (4167) |

COWS 3 YEARS AND UNDER 3½ YEARS.—STANDARD 270 LB. BUTTER-FAT.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grassvale Northwood Eve .... | Jersey | .... | 3-7-42 | 2-9-45 | 273 | 27 | 11,511 | 5·69 | 655·15 | R. H. Rose & Son ... | Mornmoot Northwood Beau (17798) |
| Juadine Peerless Lily 20th .... | do. | .... | 10-12-41 | 4-5-45 | 273 | 27 | 8,976 | 6·10 | 547·67 | Miss L. G. Hancock .... | Austral Park Wonderful Standard (14243) |
| Grassvale Lady Fowler 35th | do. | .... | 1-3-42 | 23-6-45 | 273 | 14 | 7,182 | 5·97 | 428·86 | R. H. Rose & Son ... | Mornmoot Northwood Beau (17798) |
| Kapara Happy Days .... | do. | .... | 3-12-41 | 19-5-45 | 273 | 17 | 63,51 | 5·55 | 353·09 | D. Bradford ... ... | Grantham Easter Oxford (14677) |
| Denmak Mary's Bonnie .... | Guernsey | 10295 | 22-7-41 | 26-12-44 | 273 | 22 | 6,426 | 5·38 | 345·83 | Denmark Research Station | Denmark Lady's Goldseeker (4799) |
| Juadine Peerless Lily 21st .... | Jersey | .... | 5-9-42 | 3-12-45 | 180 | 19 | 4,875 | 6·69 | 326·43 | Miss L. G. Hancock .... | Austral Park Wonderful Standard (12423) |
| Denmark Dame 2nd .... | Guernsey | 10289 | 6-11-41 | 22-12-44 | 273 | 18 | 5,844 | 5·56 | 325·02 | Denmark Research Station | Denmark Lady's Goldseeker (4799) |
| Kapara Velveteen .... .... | Jersey | .... | 23-5-42 | 15-6-45 | 273 | 8 | 6,204 | 5·03 | 312·34 | D. Bradford .. ... | Congelin Mandarin (14542) |
| Eungella Miss Muffet .... | do. | .... | 5-5-42 | 20-6-45 | 273 | 14·5 | 5,488 | 5·41 | 297·03 | D. G. Spark .... .... | Travalgon Starbright King (18129) |
| Norinya Nita .... .... | do. | .... | 3-9-41 | 11-12-44 | 273 | 11·5 | 5,179 | 5·55 | 287·75 | Mrs. A. G. Eckersley ... | Navua Royal Star (15869) |
| Wattle Creek Buttercup .... | A.I.S. | .... | 5-1-42 | 13-7-45 | 240 | 4 | 7,200 | 3·95 | 284·64 | E. T. Thatcher .. | Wooroloo Royal Standard (6414) |
| Radyr Park Dorothy 20th .... | Jersey | .... | 17-6-42 | 15-7-45 | 273 | 6 | 5,748 | 4·85 | 279·24 | L. M. Temple .... | Navua September Lad (14023) |
| Kapara Dairymaid .... .... | do. | .... | 24-6-42 | 12-7-45 | 273 | 6 | 5,508 | 5·03 | 277·08 | D. Bradford .. ... | Congelin Mandarin (14542) |
| Woorloo Vanity .... .... | A.I.S. | 41211 | 12-8-41 | 26-12-44 | 273 | 14 | 6,402 | 4·56 | 275·96 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Wattle Creek Marjorie .... | do. | .... | 30-7-41 | 23-10-44 | 273 | 15 | 6,135 | 4·28 | 262·62 | E. T. Thatcher .. | Wattle Creek Duchess's Monarch (5399) |
| Norinya Nada .... .... | Jersey | .... | 10-11-41 | 4-12-44 | 273 | 12 | 5,181 | 4·99 | 259·00 | Mrs. A. G. Eckersley .... | Navua Royal Star (15869) |
| Wattle Creek Ruby .... .... | A.I.S. | .... | 1-11-41 | 17-7-45 | 240 | 6 | 5,790 | 4·22 | 248·43 | E. T. Thatcher .. | Wooroloo Royal Standard (6414) |
| Glenavon Dahlia 15th .... | do. | .... | 30-4-42 | 31-7-45 | 273 | 7 | 5,811 | 4·23 | 245·91 | D. Bevan & Sons .. | Blackland's Monarchs Commander (1877) |
| Carbunup Esther .... .... | do. | .... | 18-2-42 | 26-5-45 | 273 | 3 | 6,099 | 4·01 | 244·61 | D.H. Bell .. ... | Glanavon Maestro (4833) |
| Muresk Delanthia .... .... | Guernsey | .... | 2-6-42 | 16-9-45 | 273 | 18 | 5,694 | 4·28 | 244·25 | Muresk Agricultural College | Muresk Arthur (4338) |
| Korigekup Lady Morn .... | Jersey | .... | 24-4-42 | 22-5-45 | 273 | 7 | 4,176 | 5·74 | 239·99 | Mrs. A. G. Eckersley .... | Mornmoot Northwood Beau (17798) |
| Travalgan Starbright 18th .... | do. | .... | 2-6-42 | 18-6-45 | 273 | 11 | 4,278 | 5·51 | 235·91 | W. H. & T. F. Robinson | Orphanage Douglas (18919) |
| Narrogin Milly .... .... | A.I.S. | .... | 5-5-42 | 14-5-45 | 273 | 15 | 6,780 | 3·42 | 232·24 | Narrogin School of Agriculture | Tipperary Amy's Mascot (6338) |
| Glenavon Melba 5th .... | do. | .... | 16-4-42 | 11-8-45 | 273 | 12 | 5,796 | 3·95 | 229·64 | D. Bevan & Sons .... | Newstead Triumph (3420) |

## TABLE 9—HERD TESTING—continued.

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight of Milk Last Day of Test. lb. | Weight of Milk for Period. lb. | Average Test. % | Weight of Butter Fat for Period. lb. | Owner. | Sire. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **COWS 3 YEARS AND UNDER 3½ YEARS—STANDARD 270 LB BUTTER-FAT.—*continued.*** | | | | | | | | | | | |
| Camden Pit-a-Pat | Jersey | .... | 15 1 42 | 26 1–45 | 240 | 15 | 3,900 | 5·85 | 228·30 | B. Langridge | Greenmount Golden Sultan (14688) |
| Clovelly Lily | Guernsey | 10244 | 25 8–42 | 6–9–45 | 240 | 7 | 3,990 | 5·67 | 226·59 | Mrs. L. R. Barnsby | Lansdowne Polydymite (4995) |
| Clovelly Kitty | do. | 10243 | 20 6 42 | 5–7–45 | 273 | 9 | 4,647 | 4·84 | 225·25 | Mrs. L. R. Barnsby | Lansdowne Polydymite (4995) |
| Colmyn Coral 2nd | Jersey | .... | 15 9–42 | 17–11–45 | 210 | 10 | 4,020 | 5·42 | 218·16 | C. H. Ironmonger | Greenmount Cream Lad (18577) |
| Plenarbor Curley | A.I.S. | .... | 26 6–42 | 7 9–45 | 273 | 12 | 5,946 | 3·64 | 216·97 | Mrs. B. Alexander | Glanavon Genius (3957) |
| Glenavon Pink Pearl 5th | do. | 36573 | 16–8–41 | 10–11–44 | 273 | 9 | 5,307 | 3·91 | 207·91 | D. Bevan & Son | Tipperary President (5335) |
| Muresk Margeurite | Guernsey | 11068 | 3–2–42 | 20 5 45 | 273 | 9 | 3,477 | 5·92 | 206·16 | Muresk Agricultural College | Muresk Arthur (4338) |
| Wattle Creek Scarlet | A.I.S. | .... | 16 8–42 | 23–9–45 | 240 | 11 | 5,040 | 4·07 | 205·14 | E. T. Thatcher | Wattle Creek Duchess's Monarch (5399) |
| Plenarbor Saphire | do. | .... | 5 3–42 | 30–7–45 | 240 | 5·5 | 5,175 | 3·95 | 204·84 | Mrs. V. Alexander | Glanavon Genius (3957) |
| Glanavon Daphne 8th | do. | .... | 14 4 42 | 24–8–45 | 240 | 7 | 5,070 | 3·99 | 202·32 | D. Bevan & Sons | Newstead Triumph (3420) |
| Rosella Jeanette | Guernsey | .... | 2–4–42 | 31 7–45 | 240 | 1·5 | 3,225 | 5·77 | 186·21 | Darnell Bros. | Muresk Commander (9599) |
| Glanavon Golden Girl 7th | A.I.S. | .... | 5–8–42 | 9 9 45 | 210 | 8 | 4,290 | 4·26 | 182·79 | D. Bevan & Sons | Newstead Triumph (3420) |
| Wattle Creek Stella | do. | .... | 22 9–43 | 9 10 45 | 210 | 8 | 4,470 | 4·02 | 180·12 | E. T. Thatcher | Wattle Creek Duchess's Monarch (5399) |
| Muresk Vanity Fair | Guernsey | 11075 | 20 4 42 | 25–7–45 | 240 | 10 | 3,300 | 5·39 | 178·14 | Muresk Agricultural College | Muresk Arthur (4338) |
| Plenarbor Primrose | A.I.S. | .... | 28–6–42 | 22 9 45 | 240 | 6 | 4,620 | 3·85 | 177·87 | Mrs. V. Alexander | Glanavon Genius (3957) |
| Wooroloo Dasher | do. | 41174 | 23 2–42 | 27–4 45 | 210 | 5 | 3,930 | 4·51 | 177·39 | Wooroloo Sanatorium Farm | Wooroloo Red Baron (6412) |
| Glanavon Golden Girl 6th | do. | 36555 | 17–9 41 | 12–2–45 | 210 | 12 | 4,290 | 3·98 | 171·03 | D. Bevan & Sons | Newstead Triumph (3420) |
| Wooroloo Sun Lady 4th | do. | 41210 | 15–3–42 | 2–4–45 | 240 | 9 | 3,720 | 4·28 | 159·35 | Wooroloo Sanatorium Farm | Berry Rufus 2nd (6570) |
| Glanavon Buttercup 7th | do. | .... | 17–3–42 | 3–9–45 | 180 | 12 | 3,930 | 3·89 | 153·21 | D. Bevan & Sons | Blacklands Monarch's Commander (1877) |
| Glanavon Charmer 2nd | do. | .... | 22–12–41 | 21–1–45 | 240 | 10 | 3,720 | 4·10 | 152·85 | D. Bevan & Sons | Blacklands Monarch's Commander (1877) |
| Koojan Ace's Bluebird | Guernsey | 10686 | 9–6–42 | 30–9–45 | 180 | 7 | 3,000 | 4·66 | 139·95 | Darnell Bros. | Homestead Ace (Imp.) (1631) |
| Muresk Rosenthall | do. | .... | 2 5–42 | 7–8–45 | 210 | 9 | 2,490 | 5·03 | 125·34 | Muresk Agricultural College | Muresk Arthur (4338) |
| Mereworth Vanilla Queen 4th | Jersey | .... | 30–6–42 | 13 8 45 | 90 | 28 | 2,625 | 4·55 | 119·58 | B. Langridge | Clarendon Eyre Oxford Pioneer (11484) |
| Denmark Jonquil 2nd | Guernsey | 10294 | 19–7–42 | 30–12 45 | 120 | 8 | 1,725 | 4·54 | 78·36 | Denmark Research Station | Denmark Rosette's Dictator (4804) |
| Tipperary Lovely 6th | A.I.S. | .... | 14–9–42 | 21–12–45 | 30 | 3 | 990 | 3·65 | 36·18 | W. G. Burges | Tipperary Ace (6336) |
| **COWS 3½ YEARS AND UNDER 4 YEARS—STANDARD 290 LB. BUTTER-FAT.** | | | | | | | | | | | |
| Juadine Peerless Lily 19th | Jersey | .... | 26–10–41 | 20 5–45 | 273 | 23 | 8,039 | 6·27 | 503·05 | Miss L. G. Hancock | Austral Park Wonderful Standard (12423) |
| Grass Vale Golden Cream 25th | do. | .... | 7 5–41 | 5–5–45 | 273 | 15 | 7,425 | 6·12 | 455·14 | R. H. Rose & Son | Grassvale Gold Boy (14684) |
| Grass Vale Lady Fowler 33rd | do. | .... | 7–7 41 | 6–5–45 | 273 | 20 | 8,220 | 5·51 | 453·06 | R. H. Rose & Son | Mornmoot Northward Beau (17798) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grass Vale Northwood Nora | do. | 86646 | 23-5-41 | 8-3-45 | 273 | 19 | 6,627 | 6·37 | 422·72 | R. H. Rose & Son .... | Mornmoot Northward Beau (17798) |
| Tipperary Lovely 5th .... | A.I.S. | 40645 | 10-6-41 | 6-6-45 | 273 | 17 | 9,321 | 4·34 | 405·33 | W. G. Burges .... | Tipperary Ace (6336) |
| Grass Vale Nora's Maid .... | Jersey | .... | 9 9-41 | 8-7-45 | 273 | 13 | 7,929 | 5·07 | 402·57 | R. H. Rose & Son .... | Mornmoot Northwood Beau (17798) |
| Grass Vale Magnolia 3rd .... | do. | .... | 13-8-41 | 21-4-45 | 273 | 14 | 6,042 | 6·00 | 362·93 | R. H. Rose & Son .... | Mornmoot Northwood Beau (17798) |
| Crantock Master Princess .... | do. | .... | 28-7-41 | 12-6-45 | 273 | 11 | 7,383 | 4·84 | 357·51 | Mrs. G. H. Burnside .... | Werribee David (18183) |
| Mayvale Discoverer's Bluebell | Guernsey | 10865 | 19 10 41 | 20-7-45 | 273 | 13 | 5,589 | 5·92 | 331·35 | R. J. Giles .... .... | Koojan Ideal's Discoverer (4968) |
| Carbunup Dahlia .... .... | A.I.S. | 35386 | 22-3-41 | 19-3-45 | 273 | 24 | 8,682 | 3·78 | 328·31 | D. H. Bell .... .... | Glanavon Maestro (4833) |
| Wooregong Beauty .... .... | do. | .... | 20-6-41 | 6-5-45 | 273 | 10 | 7,590 | 4·27 | 324·45 | W. G. Burges .... | Melrose Sunny Boy (4185) |
| Eungella Dark Venus .... | Jersey | .... | 18-5-41 | 14-4 45 | 273 | 21 | 6,378 | 5·05 | 322·38 | D. G. Spark .... .... | Travalgon Starbright King (18129) |
| Narrogin Dolly .... .... | A.I.S. | 38669 | 28-8-41 | 1-4-45 | 273 | 21 | 7,698 | 4·07 | 313·69 | Narrogin School of Agriculture | Westby Masterpiece (5403) |
| Radyr Park Dorothy 19th .... | Jersey | .... | 16-3-42 | 13-10-45 | 273 | 17·5 | 7,282 | 4·26 | 310·37 | L. M. Temple .... | Navua Coronation Star (14929) |
| Clovelly Crystal .... .... | Guernsey | 10240 | 31-8-41 | 30 7-45 | 273 | 4·5 | 6,568 | 4·65 | 305·66 | Mrs. L. R. Barnsby .... | Koojan Monogram (4174) |
| Carbanup Doris .... .... | A.I.S. | 35389 | 3-8-41 | 31-7 45 | 240 | 2 | 8,355 | 3·63 | 303·87 | D. H. Bell. .... .. | Glanavon Maestro (4833) |
| Glanavon Rita 4th .... .... | do. | .... | 25-12-41 | 19-8-45 | 273 | 18 | 6,284 | 4·72 | 296·76 | D. Bevan & Sons .... | Glanavon Guthrie (5743) |
| Westlawn Patricia .... .... | do. | .... | 12-6 41 | 6 6-45 | 273 | 4 | 7,557 | 3·88 | 293·52 | Messrs. E. L. Brockman | Valliere Patrico (5363) |
| Denmark Ace's Rose .... | Guernsey | 10284 | 29-11-41 | 31 8 45 | 273 | 18 | 6,324 | 4·61 | 287·94 | Denmark Research Station | Homestead Ace (Imp.) (1631) |
| Brookfield's Queen 10th .... | do. | 10078 | 19 11-41 | 18-10-45 | 273 | 12 | 5,901 | 4·62 | 272·84 | P. G. Hampshire & Son | Yarraview Clarionette (4628) |
| Narrogin Colleen .... .... | A.I.S. | 38665 | 22-8-41 | 22 3-45 | 273 | 12·5 | 6,922 | 3·91 | 270·56 | Narrogin School of Agriculture | Westby Masterpiece (5403) |
| Radyr Park Dorothy 14th .... | Jersey | .... | 22-4-41 | 1-1 45 | 273 | 16 | 5,673 | 4·67 | 265·18 | L. M. Temple .... | Navua September Lad (14023) |
| Tipperary Maggie 8th .... | A.I.S. | 40648 | 1-9-41 | 7-8-45 | 210 | 15 | 6,270 | 4·06 | 255·18 | W. G. Burgess .. | Liberton Venturer (4988) |
| Radyr Park Clarionette 5th .... | Jersey | 88641 | 17 7-41 | 9-6-45 | 273 | 10 | 5,010 | 5·09 | 255·16 | L. M. Temple .... | Navua September Lad (14023) |
| Brookfield's Prunella .... | Guernsey | 10075 | 19-12-40 | 12-12-44 | 240 | 12 | 5,010 | 4·91 | 246·30 | P. G. Hampshire & Son | Brookfield's Baron (3936) |
| Wooroloo Ethel .... .... | A.I.S. | 41179 | 2-4 41 | 26-12-44 | 273 | 5 | 5,685 | 4·17 | 237·41 | Wooroloo Sanatorium Farm | Wooroloo Red Lad (5418) |
| Radyr Park Dorothy 16th .... | Jersey | 88643 | 4-6 41 | 6-3-45 | 273 | 5 | 4,350 | 5·36 | 233·42 | L. M. Temple . . | Navua Coronation Star (1429) |
| Muresk Dultana .... .... | Guernsey | 11060 | 22-3-41 | 16-10-44 | 273 | 8 | 4,689 | 4·93 | 321·40 | Muresk Agricultural College | Denmark Damon (2519) |
| Muresk Danzig .... .... | do. | 11062 | 15-1-42 | 15-10 45 | 240 | 16 | 4,260 | 5·12 | 218·28 | Muresk Agricultural College | Muresk Arthur (4338) |
| Muresk Diamond Lass .... | do. | 11064 | 28-10-41 | 10 5-45 | 273 | 9 | 3,897 | 5·56 | 217·03 | Muresk Agricultural College | Denmark Damon (2519) |
| Glanavon Penelope 3rd .... | A.I.S. | 36569 | 4-4-41 | 16-11-44 | 273 | 10 | 5,610 | 3·85 | 217·29 | D. Bevan & Sons .... | Blackland's Jean's Supreme (1871) |
| Wooroloo Lady Fair 5th .... | A.I.S. | 41193 | 9-5-41 | 1-3 45 | 273 | 7 | 4,671 | 4·49 | 209·95 | Wooroloo Sanatorium Farm | Wooroloo Triumph's Heir (4493) |
| Yanget Grace .... .... | do. | .... | 3-9-41 | 25-6-45 | 273 | 9 | 5,892 | 3·54 | 209·10 | Mrs. V. Alexander .... | Yanget Baron |
| Rosella Girlie .... .... | Guernsey | .... | 15-2-42 | 15-9-45 | 210 | 3·5 | 4,065 | 4·99 | 202·98 | Darnell Bros. .... | Muresk Commander |
| Planarbor Valli .... .... | A.I.S. | .... | 15-2-42 | 2-9-45 | 210 | 9 | 4,410 | 3·98 | 175·65 | Mrs. V. Alexander . .. | Glanavon Genius (3957) |
| Tipperary Dove 19th .... | do. | 40639 | 9 10-41 | 26-8-45 | 150 | 13 | 3,720 | 4·31 | 160·68 | W. B. Burges .... | Liberton Venturer (4988) |
| Wooroloo Bella .... .... | do. | 41168 | 26-4-41 | 9-12-44 | 240 | 5 | 3,660 | 4·36 | 159·75 | Wooroloo Sanatorium Farm | Parkview Guardian (2557) |
| Glanavon Doris 12th .... | do. | 36540 | 17-2 41 | 21-11-44 | 210 | 7 | 3,540 | 4·05 | 143·40 | D. Bevan & Sons .... | Tipperary President (5335) |
| Brookfield's Faith 9th .... | Guernsey | 10067 | 28 5-41 | 29-9-45 | 60 | 22·5 | 1,350 | 4·43 | 59·88 | P. G. Hampshire & Son | Yarraview Clarinet 2nd (4629) |

COWS 4 YEARS AND UNDER 4½ YEARS—STANDARD 310 LB. BUTTER-FAT.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Koojan Ideal's Judith .... | Guernsey | 10696 | 24 6-40 | 19-12-44 | 273 | 15 | 8,145 | 5·34 | 435·68 | A. W. Padbury .... | Glenburnie Ideal (Imp.) (2548) |
| Grass Vale Lady Fowler 32nd | Jersey | 86644 | 11-6-41 | 5-8-45 | 273 | 16 | 8,178 | 5·31 | 434·71 | R. H. Rose & Son .... | Mornmoot Northwood Beau (17798) |
| Carbanup Dora .... .... | A.I.S. | 35388 | 1-4-41 | 25-6-45 | 273 | 9·5 | 11,531 | 3·72 | 429·61 | D. H. Bell .... .... | Glanavon Maestro (4833) |
| Congelin Sparkle 4th .... | Jersey | ... | 15 3 41 | 27-6-45 | 273 | 15·5 | 8,131 | 4·46 | 363·18 | D. Bradford .... .... | Congelin Washington (18426) |
| Lansdowne Jocelyn .... .... | Guernsey | ... | 15 7 40 | 4-11 44 | 240 | 16·5 | 6,675 | 5·17 | 345·24 | A. W. Padbury .... | Koojan Beau Ideal (4965) |

**TABLE 9—HERD TESTING—continued.**

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight of Milk Last Day of Test. lb. | Weight of Milk for Period. lb. | Average Test. % | Weight of Butter Fat for Period. lb. | Owner. | Sire. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| COWS 4 YEARS AND UNDER 4½ YEARS—STANDARD 310 LB BUTTER-FAT.—*continued.* | | | | | | | | | | | |
| Crantock Starbright Sunset | Jersey | 85803 | 2-4-41 | 26-5-45 | 273 | 12 | 6,456 | 5·34 | 345·02 | Mrs. G. H. Burnside .... | Crantock Starbright's Airman (15491) |
| Kapara Rosebud .... .... | do. | .... | 8-6-41 | 7-8-45 | 273 | 6 | 7,053 | 4·85 | 342·52 | D. Bradford .... .... | Congelin Mandarin (14542) |
| Congelin Iolanthe 11th .... | do. | .... | 21-3-41 | 12-7-45 | 273 | 4·5 | 4,633 | 5·17 | 339·84 | D. Bradford .... .... | Congelin Washington (18426) |
| Radyr Park June 2nd .... | do. | 88645 | 16-5-41 | 12-7-45 | 273 | 15·5 | 6,841 | 4·85 | 332·17 | L. M. Temple .... | Navua Coronation Star (14929) |
| Eungella Bonetta .... .... | do. | .... | 17-5-41 | 5-7-45 | 273 | 13 | 5,919 | 5·22 | 309·00 | D. G. Spark ... .. | Travalgon Starbright King (18129) |
| Muresk Lady Boniface ... | Guernsey | 11067 | 23-4-41 | 17-8-45 | 273 | 8 | 5,814 | 5·22 | 303·97 | Muresk Agricultural College | Denmark Damon (2519) |
| Congelin Happy Days 3rd.... | Jersey | 85704 | 1-2-41 | 14-7-45 | 240 | 11 | 6,660 | 4·51 | 300·81 | D. Bradford ... | Congelin Washington (18426) |
| Glanavon Spangle 2nd .... | A.I.S. | .... | 25-7-41 | 18-8-45 | 273 | 13 | 6,639 | 4·30 | 285·72 | D. Bevan & Sons .... | Blacklands Monarch's Commander (1877) |
| Lansdowne Bonny Jean 2nd | Guernsey | 10707 | 12-6-41 | 22-10-45 | 273 | 10·5 | 4,941 | 5·52 | 273·06 | P. G. Hampshire & Son | Koojan Beau Ideal (4965) |
| Glanavon Doris 13th ... | A.I.S. | 36541 | 25-2-41 | 31-3-45 | 273 | 18 | 6,564 | 4·12 | 271·02 | D. Bevan & Sons .... | Blacklands Monarch's Commander (1877) |
| Glanavon Ettie 2nd .... | do. | 36545 | 17-10-40 | 24-12-44 | 273 | 13 | 6,039 | 4·24 | 256·08 | D. Bevan & Sons .... | Glanavon Gold's Final (5742) |
| Narrogin Daisybell .... ... | do. | 38668 | 10-10-40 | 17-3-45 | 273 | 5·5 | 6,091 | 4·19 | 255·74 | Narrogin School of Agriculture | Westby Masterpicce (5403) |
| Clovelly Wavelet .... .... | Guernsey | 10247 | 28-5-41 | 9-9-45 | 180 | 9 | 5,010 | 4·53 | 227·01 | Mrs. L. R. Barnsby.... | Koojan Monogram (4174) |
| Radyr Park Dorothy 15th .... | Jersey | 88642 | 26-4-41 | 25-6-45 | 240 | 5 | 4,395 | 4·76 | 209·49 | L. M. Temple .... | Navua Coronation Star (14929) |
| Glanavon Buttercup 4th .... | A.I.S. | 36529 | 12-10-40 | 28-12-44 | 240 | 9 | 4,080 | 4·16 | 170·04 | D. Bevan & Sons .... | Parkview Commodor (306) |
| Wooroloo Sun Lady 3rd .... | do. | 41209 | 16-2-41 | 4-4-45 | 150 | 7 | 3,120 | 4·36 | 136·05 | Wooroloo Sanatorium Farm | Wooroloo Red Lad (5418) |
| Plenarbor Duchess .... .... | do. | 39211 | 12-9-40 | 14-2-45 | 150 | 8 | 1,785 | 4·21 | 75·15 | Mrs. V. Alexander ... | Wooroloo Triumph's Heir (4493) |
| COWS 4½ YEARS AND UNDER 5 YEARS—STANDARD 330 LB. BUTTER-FAT. | | | | | | | | | | | |
| Juadine Queen .... .... | Jersey | 87022 | 20-5-40 | 1-2-45 | 273 | 29·5 | 8,968 | 6·37 | 571·69 | Miss L. G. Hancock .... | Austral Park Wonderful Standard (12423) |
| Grass Vale Lady Fowler 31st | do. | 81634 | 17-8-40 | 6-5-45 | 273 | 23 | 9,069 | 5·31 | 481·94 | R. H. Rose & Son ... | Grass Vale Gold Boy (12684) |
| Koojan Golden Jewel .... | Guernsey | 8805 | 12-3-40 | 21-1-45 | 273 | 18 | 7,134 | 6·07 | 433·22 | A. W. Padbury .... | Koojan Beau Ideal (4965) |
| Congelin Velveteen 2nd .... | Jersey | 80831 | 19-7-40 | 11-6-45 | 273 | 14·5 | 9,193 | 4·70 | 432·57 | D. Bradford .... .... | Rosecliff Marchalong (15094) |
| Tipperary Beauty 9th ... | A.I.S. | 40631 | 21-2-40 | 11-1-45 | 273 | 22 | 9,246 | 4·32 | 399·86 | W. G. Burges .... | Blacklands Monarch's Commander (1877) |
| Colmyn Golden Mayflower.... | Jersey | 80803 | 20-8-40 | 9-6-45 | 273 | 10 | 8,370 | 4·67 | 391·09 | C. H. Ironmonger .. | Clarendon Eyre Golden Oxford (13606) |
| Tipperary Beauty 13th .... | A.I.S. | 40634 | 23-1-41 | 28-9-45 | 273 | 18 | 8,604 | 4·27 | 367·88 | M. H. Montgomery | Blacklands Monarch's Commander (1877) |
| Kapara Sparkle's Lassie .... | Jersey | 82173 | 22-8-40 | 27-5-45 | 273 | 12·5 | 6,832 | 5·14 | 351·54 | D. Bradford .... .... | Congelin V.C. (16412) |
| Wooroloo Pigeon .... .... | A.I.S. | 41198 | 20-9-40 | 16-6-45 | 273 | 19 | 7,962 | 4·32 | 343·99 | Wooroloo Sanatorium Farm | Wooroloo Triumph's Heir (4493) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wooroloo Nettu 3rd .... | do. | 41197 | 6-12-40 | 15-9-45 | 273 | | 7,614 | 4·46 | 340·14 | Wooroloo Sanatorium Farm | Wooroloo Red Lad (5418) |
| Colmyn Golden Joy Bells .... | Jersey | 80799 | 11-6-40 | 14-5-45 | 273 | 12·5 | 6,262 | 5·28 | 330·71 | C. H. Ironmonger .... | Clarendon Eyre Golden Oxford (13606) |
| Narrogin Stella .... .... | A.I.S. | 38676 | 19-4-40 | 13-3-45 | 273 | 7·5 | 6,907 | 4·15 | 286·81 | Narrogin School of Agriculture | Westby Masterpiece (5403) |
| Wooroloo Lilac 2nd .... | do. | .... | 18 12 39 | 19-10-44 | 273 | 7 | 6,111 | 4·39 | 268·65 | Wooroloo Sanatorium Farm | Wooroloo Triumph's Heir (4493) |
| Colmyn Golden Lustre .... | Jersey | .... | 5-9-40 | 5-7-45 | 273 | 11 | 5,253 | 5·06 | 266·01 | C. H. Ironmonger .... | Clarendon Eyre Golden Oxford (13606) |
| Wooroloo Jeanette 4th .... | A.I.S. | 41190 | 19-9-40 | 4-9-45 | 273 | 9 | 6,042 | 4·37 | 264·12 | Wooroloo Sanatorium Farm | Wooroloo Red Lad (5418) |
| Eungella Coquette .... .... | Jersey | 81271 | 24-5-40 | 13-4-45 | 273 | 16 | 4,878 | 5·27 | 257·12 | D. G. Spark .... .... | Greenmount Golden Sovereign (14687) |
| Mayvale Rosy Aster .... | Guernsey | 10870 | 27 9-40 | 11-7-45 | 240 | 14 | 4,800 | 5·31 | 255·00 | R. J. Giles .... .... | Denmark Rosy Outlook (4017) |
| Rosella Zinnia .... .... | do. | 11430 | 11-8-40 | 10-6-45 | 240 | 7 | 5,670 | 4·32 | 245·28 | Darnell Bros. .... | Muresk Paul (4356) |
| Clovelly Tigress .... .... | do. | 10246 | 11-7-40 | 11-5-45 | 273 | 7 | 4,731 | 5·13 | 243·13 | Mrs. L. R. Barnsby.... | Koojan Monogram (4174) |
| Wooroloo Cherry .... .... | A.I.S. | 41171 | 28-7-40 | 23-4-45 | 210 | 7 | 5,400 | 4·37 | 236·16 | Wooroloo Sanatorium Farm | Wooroloo Red Lad (5418) |
| Wooroloo Purple .... .... | do. | 41201 | 2-10-40 | 8-5-45 | 273 | 5 | 5,445 | 4·32 | 235·66 | Wooroloo Sanatorium Farm | Wooroloo Red Lad (5418) |
| Narrogin Clara .... .... | do. | 38664 | 19-3-40 | 27-2-45 | 273 | 18 | 6,099 | 3·43 | 209·61 | Narrogin School of Agriculture | Westby Masterpiece (5403) |
| Glanavon Melba 3rd .... | do. | 36566 | 11-11-40 | 28-7-45 | 210 | 11 | 4,800 | 3·97 | 190·89 | D. Bevan & Sons .. | Blackland's Jean's Supreme (1871) |
| Mereworth Oxford Fondant | Jersey | .... | 11-5-40 | 14-5-45 | 180 | 17 | 3,975 | 4·38 | 174·54 | B. Langridge .... | Clarendon Eyre Oxford Pioneer (11484) |
| Narrogin Mollie .... .... | A.I.S. | 38672 | 22-4-40 | 5-4-45 | 273 | 13 | 4,509 | 3·41 | 153·92 | Narrogin School of Agriculture | Westby Masterpiece (5403) |
| Mereworth Starbright Queen 4th .... | Jersey | 87806 | 23-6-40 | 26-5-45 | 150 | 14 | 2,760 | 4·68 | 129·30 | B. Langridge .... | Clarendon Eyre Oxford Pioneer (11484) |
| Koojan Ace's Thelma .... | Guernsey | 10690 | 30-5-42 | 25-6-45 | 90 | 17 | 2,010 | 5·55 | 111·75 | A. W. Padbury .... | Homestead Ace (Imp.) (1631) |

COWS 5 YEARS OLD AND OVER STANDARD 350 LB. BUTTER-FAT.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Juadine Peerless Lily 13th .... | Jersey | 76977 | 20-12-38 | 25-8-45 | 273 | 28·5 | 10,510 | 6·48 | 681·73 | Miss L. G. Hancock .... | Austral Park Wonderful Standard (12423) |
| Camden Circe .... .... | do. | 80637 | 24-9-39 | 9-10-44 | 273 | 18 | 9,234 | 6·93 | 640·20 | C. E. Kruger.... .... | Greenmount Golden Sultan (14688) |
| Congelin Rose Marie 6th .... | do. | 80830 | 14-4-40 | 9-6-45 | 273 | 14 | 9,267 | 6·20 | 575·07 | D. Bradford .... .... | Rosecliffe Marchalong (15094) |
| Wooroloo Rosebud 3rd .... | A.I.S. | 33999 | 29-5-39 | 17-5-45 | 273 | 26·5 | 12,184 | 4·41 | 537·37 | Wooroloo Sanatorium Farm | Parkview Guardian (2557) |
| Congelin Iolanthe 8th .... | Jersey | 80828 | 22-4-40 | 9-5-45 | 273 | 26 | 10,113 | 5·28 | 534·72 | D. Bradford .... .... | Rosecliffe Marchalong (15094) |
| Juadine March Flower .... | do. | 81988 | 5-3-39 | 21-10-45 | 210 | 20 | 8,820 | 5·57 | 492·06 | Miss L. G. Hancock .... | Austral Park Wonderful Standard (12423) |
| Denmark Petal .... .... | Guernsey | 6968 | 4-10-37 | 31-8-45 | 273 | 13·5 | 8,110 | 5·45 | 442·72 | Denmark Research Station | Koojan Golden Prosper (2283) |
| Eungella Bright Lass .... | Jersey | 76185 | 5-8-38 | 9-7-45 | 273 | 19 | 8,967 | 4·91 | 440·54 | D. G. Spark .... .... | Greenmount Bright Lad (15640) |
| Wooroloo Heather .... .... | A.I.S. | 23247 | 5-11-37 | 4-9-45 | 273 | 6 | 10,173 | 4·32 | 439·57 | Wooroloo Sanatorium Farm | Parkview Guardian (2557) |
| Carbanup Beatrice .... .... | do. | 29617 | 13-3-39 | 24-2-45 | 273 | 32·5 | 11,812 | 3·69 | 436·62 | D. H. Bell .... .... | Glanavon Maestro (4833) |
| Glanavon Dahlia 7th .... | do. | 30581 | 23-3-38 | 23-8-45 | 273 | 20 | 10,290 | 4·14 | 427·01 | D. Bevan & Sons .... | Glanavon Neptune (3959) |
| Coogely Jonquil .... .... | Guernsey | 6945 | 1-11-37 | 18-8-45 | 273 | 22 | 7,056 | 6·03 | 425·72 | Denmark Research Station | Coogelly Judy's Goldmine (2621) |

**TABLE 9—HERD TESTING—continued.**

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight of Milk Last Day of Test. lb. | Weight of Milk for Period. lb. | Average Test. % | Weight of Butter Fat for Period. lb. | Owner. | Sire. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| COWS 5 YEARS AND OVER—STANDARD 350 LB BUTTER-FAT—*continued.* | | | | | | | | | | | |
| Claremont Fancy 9th .... | A.I.S. | .... | 30-6-40 | 30-7-45 | 27 | 34 | 10,992 | 3·80 | 417·73 | Claremont Hospital for Insane | Wooroloo Tiumph 4th (3627) |
| Kapara Sparkle 3rd .... | Jersey | 77064 | 21-7-39 | 6-6-45 | 273 | 17 | 7,971 | 5·11 | 407·57 | D. Bradford .... .... | Congelin Mandarin (14542) |
| Koojan Ace's Dulcie .... | Guernsey | 5658 | 6-3-36 | 12-1-45 | 273 | 21 | 7,563 | 5·37 | 406·77 | Denmark Research Station | Homestead Ace (Imp.) (1631) |
| Radyr Park Dorothy 10th .... | Jersey | 83556 | 4-7-39 | 15-6-45 | 273 | 20 | 8,850 | 4·58 | 406·09 | L. M. Temple .... | Navua Coronation Star (14929) |
| Carbanup Baroness .... .... | A.I.S. | 29616 | 15-4-39 | 12-3-45 | 273 | 28 | 12,264 | 3·28 | 402·85 | D. H. Bell .... .... | Glanavon Maestro (4833) |
| Wooroloo Faith .... .... | do. | 33989 | 10-1-39 | 27-10-44 | 273 | 14 | 8,772 | 4·58 | 402·22 | Wooroloo Sanatorium Farm | Glanavon Genius (3957) |
| Greenmount Bonetienne's Twinkle | Jersey | 44201 | 24-3 33 | 3-6-45 | 273 | 15·5 | 7,156 | 5·60 | 400·73 | D. G. Spark .... .... | Bellefaire Bonaparte's Bonetienne (9224) |
| Denmark Golden Glory .... | Guernsey | 6965 | 13-5-38 | 30-4-45 | 273 | 14·5 | 6,703 | 5·97 | 400·59 | Denmark Research Station | Denmark Damon (2519) |
| Denmark Diamond .... .... | do. | 6963 | 28-6-36 | 6-11-44 | 273 | 15 | 6,975 | 5·62 | 392·39 | Denmark Research Station | Denmark Damon (2519) |
| Tipperary Beauty 7th .... | A.I.S. | 33565 | 29-7-39 | 24-12-44 | 273 | 26 | 8,598 | 4·54 | 390·71 | W. G. Burges . | Wooroloo Melba's Triumph (4491) |
| Glanavon Aster .... .... | do. | 30575 | 18-1-38 | 16 2-45 | 273 | 36 | 9.768 | 3·99 | 390·34 | D. H. Bell .... ... | Glanavon Nimrod (437) |
| Crantock Silk Socks .... | Jersey | 70901 | 6-6-37 | 12-4-45 | 273 | 18 | 6,609 | 5·74 | 379·80 | Mrs. G. H. Burnside .. | Congelin Eminent's Golden (13623) |
| Carbanup Crocus .... .... | A.I.S. | 35385 | 25-3-40 | 6-3-45 | 273 | 25 | 10,755 | 3·43 | 370·10 | D. H. Bell .... .... | Glanavon Maestro (4833) |
| Denmark Dawn 2nd .... | Guernsey | 5439 | 21-3-35 | 27-10-34 | 273 | 13 | 6,639 | 5·55 | 370·64 | Denmark Research Station | Koojan Golden Prosper (2283) |
| Denmark Briar Rose .... | do. | 6959 | 15-8-37 | 8-8-45 | 273 | 18·5 | 7,885 | 4·65 | 366·92 | Denmark Research Station | Denmark Illustrious (3320) |
| Westlawn Fairy .... .... | A.I.S. | 28530 | 4-11-36 | 5-7-45 | 273 | 6 | 9,783 | 3·72 | 364·66 | Mrs. E. L. Brockman | Telyarup Roosevelt (1538) |
| Koojan Princess Juliana .... | Guernsey | 8814 | 17-4-39 | 12 7 45 | 273 | 16 | 6,828 | 5·33 | 364·15 | A. W. Padbury .... | Glenburnie Ideal (Imp.) (2548) |
| Greenmount Golden Gem .... | Jersey | 76619 | 5 7 37 | 27-5-45 | 273 | 15·5 | 6,721 | 5·40 | 363·19 | D. G. Spark .... .... | Bellefaire Bonaparte's Bonetienne (9224) |
| Westlawn Topsy .... .... | A.I.S. | 33857 | 25-10-39 | 21-7-45 | 273 | 16·5 | 9,679 | 3·75 | 363·17 | Mrs. E. L. Brockman.... | Beauna Vista Musket (3024) |
| Clovelly Rose .... .... | Guernsey | 6931 | 1-10-36 | 26-4-45 | 273 | 20 | 7,290 | 4·95 | 360·93 | Mrs. L. R. Barnsby .... | Muresk Achille's (1543) |
| Glanavon Pansy 5th .... | A.I.S. | 36568 | 13-6-39 | 9 8-45 | 273 | 21 | 8,913 | 4·04 | 360·68 | D. Bevan & Sons .. | Glanavon Franklin (4829) |
| Camden Patsy .... .... | Jersey | 85543 | 27-6-39 | 10-2-45 | 273 | 13 | 5,619 | 6·38 | 358·93 | C. E. Kruger .... | Greenmount Golden Sultan (14688) |
| Radyr Coronation Belle .... | do. | 73600 | 5-7-38 | 21-7-45 | 273 | 13 | 7,389 | 4·81 | 356·06 | L. M. Temple .... | Navua Coronation Star (14929) |
| Crantock Primula's Tulip .... | do. | 70900 | 15 3-38 | 20-8-45 | 210 | 11 | 6,210 | 5·70 | 354·24 | Mrs. G. H. Burnside .... | Congelin Eminent's Golden (13623) |
| Mayvale Discoverer's Anemone | Guernsey | 10864 | 16 7 40 | 25 7-45 | 273 | 21 | 6,933 | 5·08 | 352·88 | R. J. Giles .. .. | Koojan Ideal's Discoverer (4968) |
| Carbanup Constance .... | A.I.S. | 35384 | 25-2-40 | 15-3-45 | 273 | 30 | 10,050 | 3·51 | 352·83 | D. H. Bell .... .... | Glanavon Maestro (4833) |
| Denmark Bonnie Mary .. | Guernsey | 6958 | 30 9 37 | 26-12-44 | 273 | 19 | 6,927 | 5·05 | 350·25 | Denmark Research Station | Denmark Illustrious (3320) |
| Clovelly Golden Flirt .... | do. | 8500 | 1-6-39 | 3-7-45 | 273 | 11 | 6,843 | 5·11 | 350·18 | Mrs. L. R. Barnsby .... | Koojan Monogram (4174) |
| Wocroloo Sunlady 2nd .... | A.I.S. | .... | 25-3 40 | 2-9 45 | 273 | 20 | 7,290 | 4·80 | 350·16 | Wooroloo Sanatorium Farm | Wooroloo Red Lad (5418) |
| Noorong Grace .... .... | Jersey | 78124 | 3 10-33 | 19-5-45 | 273 | 7 | 6,366 | 5·44 | 346·80 | C. E. Kruger .... | Grassvale Butter King (8209) |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Denmark Golden Valencia 2nd | Guernsey | 8535 | 15-9-39 | 22-2-45 | 273 | 10 | 6,210 | 5·57 | 346·35 | Denmark Research Station | Koojan Ace's Goldseeker |
| Denmark Orange Bud .... | do. | 4123 | 9-8-32 | 6-12-44 | 273 | 14 | 7,182 | 4·68 | 336·30 | Denmark Research Station | Koojan Golden Prosper (22 |
| Denmark Rosette .... .... | Guernsey | 6972 | 21-7-36 | 26-10-44 | 273 | 12 | 6,126 | 5·47 | 335·11 | Denmark Research Station | Koojan Golden Prosper (2283) |
| Camden Arachne .. .... | Jersey | 80635 | 9 9-39 | 24-7-45 | 273 | 7·5 | 5,767 | 5·80 | 334·63 | C. E. Kruger .... | Greenmount Golden Sultan (14688) |
| Camden Ariadne .. .... | Jersey | 85538 | 10-8-40 | 3-9-45 | 120 | 40 | 5,820 | 5·74 | 334·75 | C. E. Kruger .. | Greenmount Golden Sultan (14688) |
| Denmark Rosemary .... | Guernsey | 5451 | 7 6-36 | 19-10-44 | 273 | 9·5 | 5,923 | 5·65 | 334·90 | Denmark Research Station | Koojan Golden Prosper (2283) |
| Capel Starbright .... .... | A.I.S. | 35381 | 15-7-40 | 26-8-45 | 273 | 16 | 9,108 | 3·64 | 332·02 | M. H. Montgomery ... | Capel Star King (4672) |
| Clovelly Golden Pride .... | Guernsey | 8501 | 26-10-38 | 23-5-45 | 273 | 11 | 7,683 | 4·66 | 330·17 | Mrs. L. R. Barnsby .... | Drakesbrook Golden Gift (2651) |
| Colmyn Golden Melody .... | Jersey | 75709 | 29-5-39 | 7-9-45 | 273 | 8 | 6,504 | 5·03 | 327·57 | C. H. Ironmonger .... | Clarendon Eyre Golden Oxford (13606) |
| Wallatin Eighty Five .... | A.I.S. | 40881 | 29-4-40 | 28-8-45 | 273 | 12 | 9,306 | 3·51 | 327·53 | M. H. Montgomery ... | Summerlea Pioneer (6240) |
| Claremont Maggie Morrison 34th | do. | 29757 | 13-5-39 | 15-8-45 | 240 | 12 | 8,010 | 4·04 | 323·64 | Claremont Hospital for Insane | Claremont Ora'l Triumph (4689) |
| Colmyn Golden Carnartion .. | Jersey | .... | 30-7-40 | 11-9-45 | 273 | 7 | 6,696 | 4·79 | 320·78 | C. H. Ironmonger .... | Clarendon Eyre Golden Oxford (13606) |
| Narinya Nanette .... .... | do. | .... | 9-6-39 | 10-12-44 | 273 | 16·5 | 6,579 | 4·85 | 319·55 | Mrs. A. G. Eckersley | Austral Park Wonderful Standard (12423) |
| Muresk Sultana .... .... | Guernsey | 7650 | 6-7-37 | 13 1-45 | 273 | 18 | 6,534 | 4·87 | 318·41 | Muresk Agricultural College | Koojan Ace's Goldseeker (3431) |
| Denmark Mary Rose .... | do. | 6966 | 7-7-38 | 23-8-45 | 273 | 11 | 6,093 | 5·22 | 318·39 | Denmark Research Station | Denmark Auric (3313) |
| Wooroloo Glory .. .... | A.I.S. | 28643 | 19-6-38 | 27-3-45 | 273 | 18 | 7,524 | 4·16 | 313·70 | Wooroloo Sanatorium Farm | Parkview Guardian (2557) |
| Merewerth Butter Queen 4th | Jersey | 82784 | 18-8-39 | 14-11-44 | 273 | 10 | 5,880 | 5·12 | 301·15 | B. Langridge .. .. | Grantham Easter's Oxford (14677) |
| Muresk Delicia .... .... | Guernsey | 9106 | 15-5-40 | 26-7-45 | 273 | 16 | 6,708 | 4·46 | 299·84 | Muresk Agricultural College | Denmark Damon (2519) |
| Radyr Park Dorothy 5th .... | Jersey | 68752 | 18-7-36 | 21-7-45 | 273 | 6·5 | 5,569 | 5·34 | 297·42 | L. M. Temple .... | Greenmount Graceful Lad (7292) |
| Grantham Easter Rye 5th .... | do. | 66773 | 8-7-37 | 26-12-44 | 273 | 16 | 5,403 | 5·43 | 293·50 | B. Langridge .. | Greenmount Black Prince (6511) |
| Radyr Park Coronation's Estrellita | do. | 83555 | 27-7-39 | 28-6-45 | 273 | 12 | 5,736 | 5·10 | 292·94 | L. M. Temple .... | Navua Coronation Star (14929) |
| Denmark Dawn Childe .. | Guernsey | 6962 | 14-5-37 | 27-11-44 | 273 | 12 | 5,196 | 5·57 | 289·38 | Denmark Research Station | Wollongbar Reformer (538) |
| Crantock Starbright's Delphinium | Jersey | .... | 30-4-39 | 12-4-45 | 273 | 15 | 6,075 | 4·75 | 289·01 | Mrs. G. H. Burnside .... | Congelin Eminen 's Golden (13623) |
| Denmark Golden Valencia .... | Guernsey | 8534 | 15-9-39 | 22-8-45 | 273 | 5 | 5,745 | 5·01 | 288·28 | Denmark Research Station | Koojan Ace's Goldseeker (3431) |
| Clovelly Bella .... .... | do. | 8498 | 20-10-39 | 28-6-45 | 240 | 10 | 5,880 | 4·89 | 288·00 | Mrs. L. R. Barnsby .... | Koojan Monogram (4174) |
| Muresk Romana .. .... | do. | 9112 | 13-5-40 | 2-6-45 | 273 | 16 | 5,928 | 4·84 | 287·40 | Muresk Agricultural College | Muresk Homestead (2075) |
| Narrogin Maisie .. .... | A.I.S. | 32146 | 1-11-38 | 22-3-45 | 273 | 16 | 7,533 | 3·76 | 283·22 | Narrogin School of Agriculture | Wooroloo Stirling 3rd (3626) |
| Clovelly Margaret .. .... | Guernsey | 6929 | 20-11-37 | 24-7-45 | 273 | 6 | 5,688 | 4·94 | 281·25 | Mrs. L. R. Barnsby .... | Nornabank Brian (3640) |
| Eungella Bo-Peep .. .. | Jersey | 71246 | 27 12-37 | 6-4-45 | 273 | 16 | 6,408 | 4·36 | 279·48 | D. G. Spark .... .... | Greenmount Golden Sovereign (14867) |
| Rosella Queen ... .... | Guernsey | 9315 | 3-7-39 | 16-6-45 | 240 | 8 | 6,000 | 4·63 | 278·16 | Darnel Bros. .... .... | Muresk Paul (4356) |
| Clovelly Golden Dawn .... | do. | 8499 | 15-10-39 | 7-6-45 | 273 | 7 | 5,421 | 5·05 | 274·00 | Mrs. L. R. Barnsby .... | Koojan Monogram (4174) |
| Koojan Golden Ripple .... | do. | 7248 | 26-3-38 | 16-5-45 | 273 | 11 | 5,673 | 4·80 | 272·86 | Denmark Research Station | Homestead Ace (Imp.) (1631) |
| Clovelly Queen .. .... | do. | 6930 | 1-7-36 | 27-6-45 | 273 | 6 | 5,928 | 4·57 | 270·96 | Mrs. L. R. Barnsby .... | Koojan Sir Garnet (847) |
| Plenarbor Tulip .... .... | A.I.S. | .... | 4-4-40 | 18-8-45 | 273 | 4·5 | 7,513 | 3·59 | 270·46 | Mrs. V. Alexander .... | Alne Bank Tena's Gift (1766) |
| Glenavon Eva 3rd .... .... | do. | 36547 | 30-5-40 | 7-10-45 | 240 | 16 | 6,600 | 4·01 | 264·75 | M. H. Montgomery .... | Blackland's Jean's Supreme (1871) |

## TABLE 9—HERD TESTING—continued.

| Name of Cow. | Breed. | Herd Book No. | Date of Birth. | Date of Entry to Test. | No. of Days in Test. | Weight of Milk Last Day of Test. lb. | Weight of Milk for Period. lb. | Average Test. % | Weight of Butter Fat for Period. lb. | Owner. | S're. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| COWS 5 YEARS AND OVER STANDARD 350 LB BUTTER-FAT—*continued.* | | | | | | | | | | | |
| Brookfield's Gloria .... .... | Guernsey | 8384 | 2-2-40 | 16-10-45 | 180 | 12 | 4,935 | 5·31 | 262·05 | P. G. Hampshire & Sons | Brookfield's Baron (3936) |
| Glanavon Fairy 5th .... | A.I.S | 36548 | 25 3-40 | 21-5 45 | 273 | 14 | 6.282 | 4·08 | 256·49 | D. Bevan & Sons ... | Blacklands Jean's Supreme (1871) |
| Clovelly Duchess .... .... | Guernsey | 8497 | 8-7-38 | 23-5-45 | 273 | 6 | 5,268 | 4·84 | 255·45 | Mrs. L. R. Barnsby .... | Muresk Nelson (3620) |
| Juadine Peerless Lily 17th .... | Jersey | 81991 | 18-12-39 | 10-5 45 | 273 | 5 | 4,050 | 6·12 | 247·80 | Mrs. A. G. Eckersley | Austral Park Wonderful Std. (14243) |
| Mereworth Starbright's Vanilla 3rd | do. | 77709 | 12-6-38 | 15-6-45 | 150 | 31·5 | 4,860 | 5·01 | 243·78 | B. Langridge .... .... | Mereworth Rye Duke (13953) |
| Yanget Graceful 4th .... | A.I.S. | .... | 9-10-39 | 28-8-45 | 240 | 14 | 6,735 | 3·61 | 243·66 | Mrs. V. Alexander .... | Maylands Defiance (2380) |
| Narrogin Donna .... .... | do. | 32144 | 27-10-39 | 11-5-45 | 273 | 13·5 | 6.535 | 3·07 | 242·59 | Narrogin School of Agriculture | Wooroloo Stirling 3rd (3626) |
| Muresk Angelica .... .... | Guernsey | 9101 | 10-9-39 | 17-9-45 | 273 | 5 | 5,115 | 4·64 | 237·66 | Muresk Agricultural College | Muresk Homestead (2075) |
| Muresk Golden Pearl .... | do. | 9107 | 9-10-39 | 1-11-44 | 273 | 8 | 4,494 | 5·17 | 232·47 | Muresk Agricultural College | Muresk Homestead (2075) |
| Muresk Treasure .... .... | do. | 9118 | 12-7-39 | 25-5-45 | 273 | 7 | 4,131 | 5·24 | 220·76 | Muresk Agricultural College | Muresk Homestead (2075) |
| Narrogin Minnie .... .... | A.I.S. | 38671 | 25-11-39 | 26-4-45 | 273 | 11 | 4,923 | 4·44 | 218·86 | Narrogin School of Agriculture | Wooroloo Stirling 3rd (3626) |
| Muresk Sunbeam .... .... | Guernsey | 9117 | 30 11 39 | 14 12 44 | 273 | 10 | 4,320 | 5·04 | 217·72 | Muresk Agricultural College | Muresk Homestead (2075) |
| Westby Laurel .... .... | A.I.S. | 40986 | 7-2-40 | 23-4-45 | 273 | 15 | 5,730 | 3·74 | 214·51 | Narrogin School of Agriculture | Westby Searchlight (3604) |
| Denmark Velveteen .... | Guernsey | 8541 | 24-7-39 | 13-7-45 | 273 | 6·5 | 4,429 | 4·79 | 212·47 | Denmark Research Station | Koojan Ace's Goldseeker (3431) |
| Mereworth Oxford's Vanilla 2nd | Jersey | 87804 | 15-2-40 | 22 6 45 | 150 | 21 | 3,810 | 5·46 | 208·14 | B. Langridge .. | Clarendon Eyre Oxford Pioneer (11484) |
| Mereworth's Starbright Audrey 4th | do. | 67932 | 10 9-37 | 29-3 45 | 210 | 17 | 43,95 | 4·72 | 207·78 | B. Langridge ... | Grantham Merry Starbright (9547) |
| Yanget Daphne 5th .... | A.I.S. | 34021 | 15-9-38 | 15-4-45 | 240 | 10 | 5,205 | 3·90 | 203·37 | Mrs. V. Alexander .... | Blacklands Lancer (1874) |
| Narrogin Aster .... .... | do. | 32142 | 1-6-39 | 7-6-45 | 240 | 10 | 5,850 | 3·46 | 202·89 | Narrogin School of Agriculture | Wooroloo Stirling 3rd (3626) |
| Plenarbor Dandelion .... | do. | 39210 | 30-12-39 | 27-3-45 | 240 | 8 | 5,400 | 3·71 | 200·43 | Mrs. V. Alexander ... | Tipperary Empress Monarch (4436) |
| Muresk Delia .... .... | Guernsey | 9105 | 11-5-39 | 24-5-45 | 273 | 9 | 4,587 | 4·26 | 195·79 | Muresk Agricultural College | Denmark Damon (2519) |
| Narrogin Charlotte .... .... | A.I.S. | 38663 | 13-4-40 | 16-5-45 | 210 | 9·5 | 5,310 | 3·61 | 192·00 | Narrogin School of Agriculture | Westby Masterpiece (5403) |
| Rosella Duchess 2nd .... | Guernsey | .... | 7-5-39 | 15-8-45 | 180 | 12 | 3,630 | 5·25 | 190·86 | Darnell Bros. .... | Muresk Paul (4356) |
| Mereworth Starbright's Belvedere 6th | Jersey | 87805 | 19-4-39 | 4-6-45 | 150 | 24 | 3,660 | 4·88 | 178·65 | B. Langridge .... | Walgett Campanile's Chief (16167) |
| Yanget Gwen .... .... | A.I.S. | 23301 | 12-10-35 | 2-6-45 | 210 | 11·5 | 5.280 | 3·11 | 174·24 | Mrs. V. Alexander .... | Sunrise of Parkview (1875) |
| Mereworth Oxford Belvedere | Jersey | .... | 26-3-40 | 12-4-45 | 210 | 14·5 | 3,885 | 4·46 | 173·37 | B. Langridge ... | Clarendon Eyre Oxford Pioneer (11484) |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Westby Polly .... .... | A.I.S. | 15141 | 21-5-32 | 2-6-45 | 210 | 8·5 | 4,935 | 3·51 | 173·19 | Narrogin School of Agriculture | Telyarup Duke (956) |
| Mereworth Oxford Silvermine | Jersey | 87803 | 28-4-40 | 7-6-45 | 150 | 20 | 3,765 | 4·54 | 171·00 | B. Langridge .... | Clarendon Eyre Oxford Pioneer (11484) |
| Tipperary Lovely 4th .... | A.I.S. | .... | 29-6-40 | 17-8-45 | 180 | 13 | 4,905 | 3·39 | 166·40 | M. H. Montgomery .... | Blackland's Monarchs Commander (1877) |
| Mereworth Oxford Carnation | Jersey | .... | 13-2-39 | 13-3-45 | 180 | 14·5 | 3,375 | 4·78 | 161·46 | B. Langridge .. . | Grantham Easter's Oxford (14677) |
| Claremont Duchess 2nd .... | A.I.S. | 9920 | 17-10-33 | 28-12-44 | 273 | 6·5 | 4,943 | 3·19 | 157·75 | Narrogin School of Agriculture | Tipperary Virginia's Re-echo (970) |
| Claremont Flora .... .... | do. | 15961 | 27-8-34 | 26-2-45 | 240 | 5·5 | 4,485 | 3·49 | 156·81 | Narrogin School of Agriculture | Claremont Herdsman (968) |
| Brookfield's Duchess .... | Guernsey | 6835 | 3-6-37 | 25-9-45 | 210 | 3·5 | 3,105 | 4·93 | 153·12 | Darnell Bros. .... | Brookfield's Majesty (3254) |
| Claremont Cherry 9th .... | A.I.S. | 15955 | 25-11-34 | 14-5-45 | 240 | 8 | 4,680 | 3·24 | 151·77 | Narrogin School of Agriculture | Tipperary Virginia's Re-echo (970) |
| Denmark Golden Dawn 2nd | Guernsey | 8527 | 2-4-40 | 19-9-45 | 240 | 4·5 6 | 2,505 | 5·76 | 144·51 | Denmark Research Station | Koojan Ace's Goldseeker (3431) |
| Crantock Napoleon's Daffodil | Jersey | 75813 | 22-10-37 | 7-10-45 | 60 | 36 | 2,310 | 5·90 | 136·38 | Mrs. G. H. Burnside .... | Crantock Blonde's Napoleon (8207) |
| Rosella Queenie .... .... | Guernsey | 9316 | 20-9-39 | 13-8-45 | 150 | 13 | 2,880 | 4·59 | 132·30 | Darnell Bros. . .. | Muresk Paul (4356) |
| Rosella Sweetheart .... .... | do. | .... | 30-7-40 | 27 11 45 | 150 | 8 | 2,880 | 4·53 | 130·56 | Darnell Bros. .... | Muresk Paul (5456) |
| Narrogin Daisy .... .... | A.I.S. | 38667 | 20-11-9 | 20-5-45 | 150 | 7 | 2,850 | 4·36 | 124·41 | Narrogin School of Agriculture | Wooroloo Stirling 3rd (3626) .... |
| Mereworth Easter Princess 2nd | Jersey | 82785 | 23-7-38 | 20-8-45 | 90 | 29 | 2,880 | 4·34 | 122·19 | B. Langridge ... | Grantham Easter's Oxford (14677) |
| Mereworth Rye Buttercup .... | do. | 67930 | 29-6-38 | 9 8 35 | 60 | 43 | 2,730 | 4·36 | 119·19 | B. Langridge .. | Mereworth Rye's Duke (13953) |
| Rosella Lady Luck .... . .. | Guernsey | 9313 | 28-7-38 | 12-10-45 | 180 | 1·5 | 2,625 | 4·49 | 117·93 | Darnell Bros. . | Brookfield's Baron (3936) |
| Mereworth's Starbright's Audrey 5th | Jersey | .... | 13-3-40 | 17-7-45 | 120 | 13 | 2,445 | 4·60 | 112·59 | B. Langridge .... | Clarendon Eyre Oxford Pioneer (11484) |
| Brookfield's Primrose .... | Guernsey | 5331 | 24-2-35 | 11-10-45 | 180 | 1·5 | 2,145 | 4·49 | 96·48 | Darnell Bros. .... | Koojan Ace's Majestic (2735) |
| Mereworth Oxfords Starbright | Jersey | .... | 15-5-40 | 22-8-45 | 60 | 29 | 1,890 | 4·87 | 92·13 | B. Langridge . .. | Clarendon Eyre Oxford Pioneer (11484) |
| Norynia Nanette .... .... | do. | .... | 9-6-39 | 26-12-46 | 90 | 19 | 1,710 | 5·16 | 88·38 | Mrs. A. G. Eckersley .... | Austral Park Wonderful Standard (12423) |
| Grassvale Design's Maggie .... | do. | 71637 | 25-11-37 | 6-10-45 | 30 | 51 | 1,530 | 4·58 | 70·20 | R. H. Rose & Son .... | Grassvale Gold Boy (14684) |
| Muresk Jessie .... .... | Guernsey | 7641 | 2-5-37 | 14-8-45 | 30 | 35 | 1,050 | 4·37 | 45·90 | Muresk Agricultural College | Muresk Homestead (2075) |
| Brookfield's Queen 8th .... | do. | 10076 | 21-8-40 | 9-12-45 | 30 | 27 | 810 | 4·68 | 37·98 | P. G. Hampshire & Sons | Yarraview Clarienet (4628) |
| Plenarbor Ruby .... .... | A.I.S. | 32637 | 9-8-39 | 29-4-45 | 60 | 13 | 1,215 | 3·07 | 37·41 | Mrs. V. Alexander .... | Tipperary Empress's Monarch (4436) |
| Mereworth Butter Queen 3rd | Jersey | 67923 | 20 6-38 | 18-8-45 | 30 | 36 | 1,080 | 3·40 | 36·72 | B. Langridge .... | Granthma Easter's Oxford (14677) |
| Brookfield's Queen 7th .... | Guernsey | 8391 | 23-6-40 | 1-11-45 | 30 | 24 | 720 | 5·03 | 36·24 | P. G. Hampshire & Sons | Yarraview Clarienet 2nd (4629) |
| Kiama Bess 14th .... .... | A.I.S. | 37636 | 19-6-39 | 14-4-46 | 30 | 30 | 900 | 3·97 | 35·76 | N. H. Montgomery .... | Kiama Trumper (3304) |
| Rosella Mayflower .... .... | Guernsey | 9314 | 11-5-40 | 14-6-45 | 60 | 13 | 870 | 3·43 | 29·85 | Darnell Bros. | Muresk Paul (4356) |

# Stock Foods.

**The following Stock Foods have been registered at the Department of Agriculture under the Feeding Stuffs Act, 1924-1942, for the year commencing 1st July, 1946.**

| Stock Food. | Reg. No. | Brand. | By whom Registered. | Materials from which Made. | Registered Analysis. | | | | | | | | Wholesale Price per ton at works (W); on rails Perth (P). |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crude Protein. | Crude Fat. | Crude Fibre. | Sodium Chloride. | Phos. Acid ($P_2O_5$). | Lime (CaO). | Other. | | |
| | | | | | % | % | % | % | % | % | % | % | £ s. d. |
| A.—SIMPLE FOODS. | | | | | | | | | | | | | |
| 1.—*Meat Meals.* | | | | | | | | | | | | | |
| Meat Meal .... | 2 | ANCHO .... | Anchorage Butchers, Ltd. | Waste meat products .. | 50·56 | 14·59 | 1·48 | ·56 | 9·39 | 11·24 | .. | .. | 12 5 0 (P) |
| Do. .... | 3 | STATE ABATTOIRS, MIDLAND JUNCTION | State Abattoirs .... | do. do. .... | 50·63 | 19·00 | 2·60 | .... | . | ... | . | . | 12 7 6 (W) |
| Do. .... .... | 18 | PANNIFEX .... | Burridge & Warren, Ltd. | do. do. .... | 40·00 | 8·00 | 3·00 | .. | .... | .. | ... | . | 15 10 0 (P) |
| Blood Meal .... | 56 | IMPERIAL .... | W. Angliss & Co. (Aust.) Pty., Ltd. | Animal offal .... ... | 85·00 | *Nil* | 1·00 | .. | ... | .... | . | .. | 14 0 0† (W) |
| Meat meal .... | 57 | do. .... | do. do. do. | do. do. .. .. | 60·00 | 10·00 | 1·00 | . | . | .. | .... | . | 10 10 0† (W) |
| Liver meal .... | 58 | do. .... | do. do. do. | do. do. .... ... | 65·00 | 20·00 | 1·00 | . | .... | .... | .. | .. | 20 0 0† (W) |
| Meat Meal .... | 61 | EXCELSIOR | Barrow Linton & Co. ... | do. do. .. .... | 45·00 | 10·00 | 1·50 | .. | . | . | .. | .. | 12 8 4† (W) |
| Do. ... | 89 | J.K.S. No. 1 .... | J. Kitchen & Son, Pty. Ltd. | Animal fat and bone meal | 40·00 | 6·00 | 1·00 | . | 14·00 | . | .. | . | On application |
| Meat and Bone Meal | 91 | S.M.P. .... .... | W. R. & N. N. Clarke .... | Animal offal and bone meal | 60·00 | 7·00 | .. | .. | .... | .. | 27% Minerals | | 9 5 0 (W) |
| Do. do. | 116 | METE O VITE | Goldsbrough, Mort & Co., Ltd. | Meat Meal and Bone Meal | 42·00 | 6·50 | 1·50 | ... | 15·00 | 20·50 | .. | .. | 17 15 0† (P) |
| Meat Meal .... | 131 | WAME .... | The West Australian Meat Export Works | Meat, blood, and bone ... | 45·00 | 9·50 | . | . | .. | . | . | . | On application |
| 2.—*Bone Meals.* | | | | | | | | | | | | | |
| Bone Meal .... | 1 | ANCHO .... | Anchorage Butchers, Ltd. | Waste meat products ... | 23·63 | 2·44 | Trace | Trace | 26·76 | 26·95 | .. | .. | 13 5 6 (P) |
| Do. .... | 4 | W.A.M.E. .... | West Australian Meat Export Works | Bones solely .. .. | 18·75 | .. | .... | 0·25 | 26·00 | 27·00 | . | . | 11 10 0 (W) |
| Bone Flour .... | 16 | TRICALOS .... | Davis Gelatine (Aust.). Pty. Ltd. | Sterilised bone flour .. | 5·00 | .. | .. | . | 32·50 | 40·00 | .. | .. | 11 15 0 (W) |
| Bone Meal .... | 59 | D.B.G. .... | W. Angliss & Co. (Aust.) Pty., Ltd. | Animal bones .... .... | .... | .... | .... | .... | 28·00 | 36·00 | .... | .... | 14 0 0† (W) |
| 3.—*Other.* | | | | | | | | | | | | | |
| Peanut Meal .... | 5 | ETA .... .... | Cruickshank Bros. .... | Peanut kernels .... .... | 49·00 | 2·00 | 6·00 | .... | .... | .... | .... | .... | 10 10 0† (F) |
| Milk Sugar Food .... | 24 | KRAFCO .... | Kraft Walker Cheese Co. Pty., Ltd. | Whey from cheese manufacture | 10·00 | 0·50 | *Nil* | .... | 1·00 | 0·70 | Lactose 68·0 | Riboflavin 25 u/g n. | 25 10 0 (P) |
| Do. do. | 25 | LACTOKRAFT | do. do. do. | do. do. do. | 10·00 | 0·50 | *Nil* | .. | 1·00 | 0·70 | 68·0 | 25 u/gm. | 28 0 0 (P) |
| Linseed Oil Meal .... | 27 | M.L.M. .... | Elder Smith & Co., Ltd.. | Linseed .. .. .... | 30·00 | 6·00 | 10·00 | .. | .... | .. | .. | .. | 13 15 0 (F) |
| Roller Bran .... | 31 | WESFARMERS | Westralian Farmers Co-operative, Ltd. | Wheat .... .. .. | 8·50 | *Nil* | 5·00 | .... | .... | .... | .. | .. | 9 2 0† (W) |
| Wheat Meal .... | 32 | do. | do. do. do. | do. .... .... .... | 8·50 | 1·00 | 3·00 | .... | .... | .... | .... | .... | 8 12 0 (W) |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wheaten Stock Meal | 68 | POLLATO .... | W. Thomas & Co. (W.A.), Ltd. | Crushed wheat .... .... | 8·00 | *Nil* | 5·00 | .... | .... | .... | .... | .... | 9 | 2 | 0 (W) |
| Stock Meal .... | 69 | STOCKMEAL | do. do. do. | do. do. .... .... | 8·00 | *Nil* | 5·00 | .... | .... | .... | .... | .... | 9 | 2 | 0 (W) |
| Do. .... .... | 67 | BRANATO .... | do. do. do. | do. do. .... .... | 8·00 | *Nil* | 9·00 | .... | ... | .... | .... | .... | 9 | 2 | 0 (W) |
| B.—COMPOUND FOODS. (1.) *Cattle Foods.* | | | | | | | | | | $CaCo_3$ | Sulphur. | Other Minerals and Herbs | | | |
| Cattle Food .... | 20 | EVE-LYN .... | Tropical Traders, Ltd. .... | Linseed meal, linseed whole, pollard, salt, limestone, chalk, animal charcoal, molasses, sulphur, sulphate of iron, copper sulphate, medicinal herbs | 7·62 | 5·47 | 14·04 | 5·06 | 7·21 | 9·52 | 2·66 | 3·80 | †21 | 5 | 0 (P) |
| Sweetened Dairy Meal | 33 | WESFARMERS | Westralian Farmers Co-operative, Ltd. | Oat meal, bran, linseed meal, peanut meal, cocoanut meal, molasses, clover pollard, bone meal, bluestone, salt, calcium carbonate | 15·00 | 2·00 | 4·00 | 1·00 | .... | As $CaCo_3$ Under 1·00 | .... | Trace Bluestone | 10 | 4 | 0 (P) |
| Dairy Meal .... | 34 | do. | do. do. do. | Wheat meal, bran, cocoanut meal, peanut meal, linseed meal, bone meal, salt, copper sulphate, calcium carbonate | 18·00 | 4·00 | 8·00 | Trace | .... | Under 5·00 | .... | Trace Bluestone | 12 | 8 | 6 (P) |
| Sweet Dairy Food | 70 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Wheat germ, molasses, bran, wheat meal, oatmeal or rolled oats, cocoanut or peanut or linseed meals*, meat meal*, dried yeast*, calcium carbonate, sodium chloride | 15·00 | 3·00 | 8·50 | Max. 1·50 | .... | Max. 3·75 | .... | .... | 9 | 10 | 0 (W) |
| "Milk Protein" or More Milk | 71 | do. .... | do. do. do. | Peanut or cocoanut or linseed meals*, wheat meal, meat or liver meals*, dried yeast*, calcium carbonate, sodium chloride | 19·00 | 4·50 | 6·50 | Max. 3·00 | .... | Max. 15·00 | .... | .... | 13 | 0 | 0 (W) |
| More Cream .... | 72 | do. .... | do. do. do. | Peanut or cocoanut or linseed meals*, whole linseed, wheat meal, meat or liver meal*, dried yeast*, calcium carbonate, sodium chloride | 19 00 | 4·50 | 6·50 | Max. 3·00 | .... | Max. 15·00 | .... | . . .. | 13 | 0 | 0 (W) |
| Dairy Meal .... | 92 | VETAMAC .... | A. H. McDonald & Co .... | Salt, sulphur, iron, bone meal, molasses, magnesium sulphate, sodium carbonate, potassium iodide, wheat meal, linseed meal, maize meal | 10·00 | 2·50 | 5·00 | 26·0 | .... | CaO 1·80 | Other Minerals 1·0 | | 26 | 15 | 0 (P) |

## STOCK FOODS—continued.

| Stock Food. | Reg. No. | Brand. | By whom Registered. | Materials from which Made. | Registered Analysis. | | | | | | | Wholesale Price per ton at Works (W) or on rails, Perth (P). |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crude Protein. | Crude Fat. | Crude Fibre. | Sodium Chloride. | Phos. Acid ($P_2O_5$). | Lime (CaO). | Other. | |
| | | | | | % | % | % | % | % | % | % | £ s. d. |
| Lin Meal .... .... | 101 | WESTERN .... | David Gray & Co., Ltd. | Linseed meal, yeast meal, bone meal, calcium carbonate, malt | 25·00 | 7·00 | 3·00 | .... | .... | .... | Trace | 13 5 0 (P) |
| Milk Food .... | 102 | do. | do. do. do. | Linseed meal, peanut meal, yeast, bone meal, oat meal, calcium, carbonate | 25·00 | 5·00 | 6·00 | .... | .... | .... | Other Minerals Trace | 13 5 0 (P) |
| Sweet Dairy Food | 104 | do. | do. do. do. | Malt combings, yeast, oat meal, wheat meal, mill offal, linseed meal, calcium carbonate, salt | 15·00 | 2·00 | 8·00 | Trace | .. . | .... | Trace | 9 15 0 (P) |
| (2.) *Calf Foods.* | | | | | | | | | | | | |
| Calf Food .... | 17 | STAR .... .... | Robt. Harper & Co., Ltd. | Oats, linseed, maize, barley, rice meals, condiments | 12·50 | 12·50 | 6·00 | .... | .. . | .. . | .... .. . | 18 0 0 (F) |
| Do. .... .... | 23 | EVE-LYN .... | Tropical Traders, Ltd. ... | Wheat, pollard, whole linseed, salt, sugar, chalk, sulphur, sodium bicarbonate, copper sulphate, medicinal herbs | 10·75 | 4·77 | 3·86 | 2·89 | .... | .... | Other 3·38 | 22 0 0 †(P) |
| Do. .... .... | 26 | PARSONS .... | Parsons Bros. & Co. Pty., Ltd. | Wheat, oat bran, linseed, limestone, salt | 12·00 | 2·00 | 6·00 | 1·00 | .... | $CaCo_3$. 1·00 | .... .... | On application |
| Calf Meal .... | 35 | WESFARMERS | Westralian Farmers Co-operative, Ltd. | Linseed meal, peanut meal, wheat meal, maize meal, butter milk, bone meal, liver meal,* bran, barley meal, salt, bluestone, calcium carbonate. | 18·00 | 5·00 | 8·00 | Trace | .... | Under 2·00 | Trace | 13 4 0 (P) |
| Calf Food .... | 73 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Peanut or linseed or cocoanut meals*, milk powder*, wheat meals, whole linseed, oat meal or rolled oats*, meat meal or liver meal*, calcium carbonate, sodium chloride | 15·50 | 4·50 | 5·00 | Max. 3·00 | .... | $CaCo_3$. Max. 15·00 | .... .... | 14 10 0 (P) |
| Do. .... .... | 93 | VETAMAC .... | A. H. McDonald & Co. .... | Wheat, pollard, maize meal, linseed meal, mutton bird oil | 20·23 | 13·13 | 5·75 | .... | .... | .... | Mutton Bird Oil 10% | 37 10 0 (P) |

| | | | | | | | | | | CaO | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. .... .... | 103 | WESTERN .... | David Gray & Co., Ltd. | Linseed meal, oat meal, peanut meal, powdered milk, yeast, bone meal, trace minerals | 20·00 | 4·00 | 7·00 | .... | 2·00 | 2·00 | .... | .... | 14 | 5 | 0 (P) |
| Do. .... .... | 117 | KAF-O-VITE | Goldsbrough, Mort & Co., Ltd. | Rice meal, barley meal, wheat, pollard, linseed meal, bone charcoal, calcium carbonate, cane sugar, essence of aniseed | 16·50 | 9·50 | 7·50 | .... | ·80 | 1·50 | .... | ... | 26 | 0 | 0† (P) |
| (3.) *Sheep Foods.* | | | | | | | | | | | | | | | |
| Sheep Food .... | 21 | EVE-LYN .... | Tropical Traders, Ltd. .... | Linseed meal, whole linseed, pollard, salt, limestone, chalk, animal charcoal, molasses, sulphur, sulphate of iron, copper sulphate, medicinal herbs | 9·81 | 5·95 | 14·79 | 5·82 | 4·34 | 10·15 | Sulphur. 2·63 | Other. 4·04 | 21 | 5 | 0† (P) |
| Meggits Linseed Sheep Nuts | 28 | M.L.M..... .... | Elder, Smith & Co., Ltd. | Linseed .... .... .... | 30·00 | 6·00 | 10·00 | .... | .... | .... $CaCo_3$. Less than | .... | .... | 13 | 15 | 0 (F) |
| Maintenance Sheep Cubes | 36 | WESFARMERS | Westralian Farmers Co-operative, Ltd. | Oat meal, wheat meal, barley meal, clover pollard, linseed meal, peanut meal, cocoanut meal, salt, molasses, calcium carbonate | 14·00 | 4·50 | 6·50 | 0·50 | .... | 1·00 | .... | .... | 11 | 16 | 0 (P) |
| Sheep Breeders Cubes | 37 | do. | do. do. do. | Oat meal, barley meal, wheat meal, clover pollard, linseed, peanut and cocoanut meals, molasses, salt, calcium carbonate | 18·00 | 7·50 | 7·50 | 0·50 | .... | $CaCo_3$. Less than 1·00 | .... | .... | 14 | 14 | 0 (P) |
| Maintenance Sheep Nuts | 105 | WESTERN .... | David Gray & Co., Ltd. | Linseed meal, yeast meal, calcium carbonate, bone meal, salt, trace minerals | 16·00 | 3·00 | 7·00 | 0·50 | .... | 1·50 | .... | Trace | 11 | 14 | 0 (P) |
| Ewe and Lamb Nuts | 106 | do. .... | do. do. do. | Linseed meal, yeast meal, bone meal, malt, wheat germ, salt, trace minerals | 25·00 | 3·00 | 7·00 | 0·50 | .... | 1·50 | .... | Trace | 13 | 19 | 0 (P) |
| (4.) *Poultry Foods.* | | | | | | | | | | | | | | | |
| Laying Mash No. 1 | 38 | WESFARMERS | Westralian Farmers Co-operative, Ltd. | Wheat meal, pollard, bran, oat meal, meat meal, butter milk, linseed meal, liver meal*, salt, bone meal, calcium carbonate | 17·50 | 4·00 | 7·00 | Less than 1·00 | | $CaCo_3$. 2·00 | .... | .... | 9 | 13 | 6 (P) |
| Laying Mash No. 2 | 39 | do. | do. do. do. | Wheat meal, roller bran, bran, linseed meal, butter milk, salt, bone meal, calcium carbonate | 14·00 | 3·00 | 7·00 | 1·00 | .... | Less than 3·00 | .... | .... | 9 | 13 | 6 (P) |
| Laying Pellets No. 1 | 40 | RED COMB ... | do. do. do. | Wheat meal, pollard, bran, oat meal, meat meal, butter milk, linseed meal, liver meal*, bone meal, salt, calcium carbonate | 17·50 | 4·00 | 7·00 | Less than 1·00 | .... | 2·00 | .... | .... | 10 | 3 | 6 (P) |

**STOCK FOODS**—continued.

| Stock Food. | Reg. No. | Brand. | By whom Registered. | Materials from which Made. | Registered Analysis. | | | | | | | | Wholesale Price per ton at Works (W) or on rails Perth (P). |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crude Protein. | Crude Fat. | Crude Fibre. | Sodium Chloride. | Phos. Acid ($P_2O_5$). | Lime (CaO). | Other. | | |
| | | | | | % | % | % | % | % | % Less than | % | % | £ s. d. |
| Laying Pellets No. 2 | 41 | RED COMB .... | Westralian Farmers Co-operative Ltd. | Wheat meal, roller bran, bran, linseed meal, butter milk, bone meal, salt, calcium carbonate | 14·00 | 3·00 | 7·00 | 1·00 | .... | 3·00 | .... | .... | 10 3 6 (P) |
| Growers Pellets .... | 42 | do. .... | do. do. do. | Wheat meal, pollard, bran, butter milk, meat meal, salt, calcium carbonate | 14·00 | 4·00 | 5·00 | Less than 1·00 | .... | Less than 2·00 | .... | .... | 11 13 6 (P) |
| Growers Mash .... | 43 | WESFARMERS | do. do. do. | Wheat meal, pollard, bran, butter milk, meat meal, salt, calcium carbonate | 14·00 | 4·00 | 5·00 | Less than 1·00 | .... | Less than 2·00 | .... | .. | 11 3 6 (P) |
| Protein Meal "A" | 44 | do. | do. do. do. | Bone meal, meat meal, butter milk, liver meal*, maize meal, calcium carbonate | 42·00 | 9·00 | 2·00 | .... | .... | $CaCo_3$ 8·00 | .... | .... | 17 2 6 (P) |
| Protein Meal "B" | 45 | do. | do. do. do. | Meat meal, liver meal*, bone meal, linseed meal, calcium carbonate | 45·00 | 9·00 | 3·00 | .... | .... | 10·00 | .... | .... | 15 5 0 (P) |
| Egg Laying Mash | 63 | EGGLAYER .... | Barrow Linton & Co. .... | Bran, pollard, wheat meal, lime, oat pollard, meat meal, salt | 17·15 | 3·50 | 4·25 | 1·00 | . . | 2·00 | . | .... | 11 0 0 (W) |
| Laying Mash No. 1 | 76 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Bran, pollard, wheaten meals, oat meal*, meat meal, wheat germ, dried blood*, dried yeast*, milk powder*, dehydrated lucerne meal*, calcium carbonate, salt, liver and fish meals* | 17·00 | 4·50 | 7·50 | 1·50 | .... | Max. 3·75 | .... | .... | 9 12 6 (P) |
| Laying Mash No. 2 | 77 | do. .... | do. do. do. | Bran, pollard, wheaten meal, wheat germ, peanut or cocoanut or linseed meals*, meat meal*, dried blood*, dried yeast*, milk powder*, oat meal*, dehydrated lucerne meal*, fine salt, calcium carbonate | 15·50 | 4·50 | 7·50 | 1·50 | .... | Max. 3·75 | .... | .... | 9 12 6 (P) |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Special Laying Mash with Liver Meal | 78 | THOMAS ... | W. Thomas & Co. (W.A.) Ltd. | Bran, pollard, wheat meal, liver meal, calcium carbonate, sodium chloride | 18·00 | 2·50 | 7·50 | 1·50 | .... | $CaCo_3$ Max. 3·75 | .... | .... | 9 16 0 | (P) |
| Quick Lay .... | 79 | do. ... | do. do. do. | Meat meal, dried blood, bone meal, liver meal*, milk powder*, peanut or cocoanut or linseed meals*, wheaten meal, dried yeast*, fish meal*, calcium carbonate, sodium chloride, potassium iodine* | 35·00 | 7·00 | 4·00 | Max. 3·00 | . . | Max. 15·00 | .... | .. | 14 15 0 | (W) |
| Egg Milk .... | 80 | do. ... | do. do. do. | Milk powder, linseed or cocoanut or peanut meals*, wheat meal, dried yeast*, calcium carbonate, sodium chloride | 21·50 | 4·00 | 2·00 | Max. 3·00 | ... | Max. 15·00 | .. | . | 24 10 0 | (P) |
| Laying Mash "A" | 99 | WESTERN .... | David Gray & Co., Ltd. | Bran, pollard, wheat meal, meat meal, bone meal, linseed meal, yeast, calcium carbonate | 17·00 | 3·00 | 7·50 | .... | Max. 2·00 | 1·50 | .. | .... | 9 13 6 | (P) |
| Laying Mash "B" | 98 | do. .... | do. do. do. | Bran, pollard, wheat meal, yeast, bone meal, linseed meal, calcium carbonate | 15·00 | 3·00 | 7·50 | .... | 2·00 | 1·50 | .... | .. | 9 13 6 | (P) |
| Egg Food .... | 100 | do. .... | do. do. do. | Meat meal, blood meal, liver meal, linseed meal, yeast meal, malt, bone meal | 44·00 | 6·00 | 4·00 | .. | .... | $CaCo_3$ 5·00 | .... | .... | 15 5 0 | (P) |
| Laying Mash .... | 107 | MORLAY .... | Robert B. Young .... | Wheat meal, bran, pollard, meat meal, bone meal, oyster shell flour and other minerals | 16·75 | 3·00 | 6·00 | 1·20 | 1·28 | CaO. 1·56 | .. | .... | 11 5 0 | (W) |
| Laying Allmash .... | 108 | do. .... | do. do. .... | Wheat meal, bran, pollard meat meal, bone meal, oyster shell flour and other minerals | 15·25 | 3·00 | 6·25 | 1·00 | 1·50 | 1·50 | .... | .... | 10 15 0 | (W) |
| Laying Mash "B" | 109 | do. .... | do. do. .... | Wheat meal, bran, pollard, bone meal, linseed or cocoanut meals*, oyster shell flour and other minerals | 14·00 | 3·50 | 6·25 | 1·15 | 1·50 | 1·56 | .... | .. | 11 5 0 | (W) |
| Poultry Food .... | 60 | EGGOLEEN .... | Barrow, Linton & Co. .... | Meat meal, liver meal, bone meal, butter milk powder, salt, and other minerals | 40·00 | 9·00 | 1·50 | 2·00 | .... | Max. 2·00 | . | .... | 16 0 0 | †(W) |
| Fattening Mash .... | 62 | DUKKO .... | do. do. .... | Bran, pollard, wheat meal, oat pollard, cocoanut, bone meal, biscuit meal, salt, lime | 15·00 | 4·20 | 2·00 | 1·00 | .... | 2·00 | .... | .... | 10 15 0 | (P) |
| Growing Mash .... | 64 | GROWELL .... | do. do. .... | Bran, pollard, wheat meal, oat pollard, maize, meat meal, limestone, salt, wheat germ, dried blood | 16·90 | 3·95 | 4·56 | 1·00 | .... | 2·00 | .... | .... | 10 12 6 | (W) |

## STOCK FOODS—continued.

| Stock Food. | Reg. No. | Brand. | By whom Registered. | Materials from which Made. | Registered Analysis. | | | | | | | | Wholesale Price per ton at Works (W) or on rails, Perth (P). |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crude Protein. | Crude Fat. | Crude Fibre. | Sodium Chloride. | Phos. Acid ($P_2O_5$). | Lime (CaO). | Other. | | |
| | | | | | % | % | % | % | % | % $CaCO_3$ Max. | % | % | £ s. d. |
| Fattening Mash .... | 81 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Oat or barley meals*, wheat germ, bran, pollard, wheaten meals, peanut or cocoanut or linseed meals* milk powder*, dried yeast*, dehydrated lucerne meal*, sodium chloride, calcium carbonate | 14·50 | 3·50 | 8·00 | 1·50 | .... | 3·75 | | .... | 9 15 0 (P) |
| Quick Grow .... | 87 | do. .... | do. do. do. | Meat, blood and bone meals, wheat meal, dried yeast*, oil meals*, calcium carbonate, sodium chloride | 30·00 | 10·00 | 4·00 | Max. 3·00 | .... | Max. 15·00 | .... | .... | 13 5 0 (W) |
| Growing Mash .... | 110 | MORLAY .... | Robert B. Young .... | Wheat meal, bran, pollard, meat meal, bone meal, buttermilk, oyster shell flour and other minerals | 14·50 | 2·50 | 5·75 | 1·05 | 1·99 | 1·95 | .. | .... | 11 0 0 (W) |
| Growing Allmash | 111 | do. .... | do. do. .... | Wheat meal, bran, pollard, meat meal, bone meal, oyster shell flour, butter milk powder and other minerals | 13·75 | 3·00 | 6·00 | 1·17 | 1·04 | 1·75 | .. | .. | 10 10 0 (W) |
| D Mash (Fattening Mash) | 112 | do. .... | do. do. .... | Wheat meal, bran, pollard, bone meal, linseed or cocoanut meal*, and other minerals | 13·50 | 4·00 | 6·50 | 1·15 | 1·55 | 1·50 | .. | .. | 10 15 0 (W) |
| Starting Mash .... | 65 | VITALIZER | Barrow, Linton & Co. | Bran, pollard, wheat meal, oat pollard, meat meal, milk powder, lime stone, dried blood, wheat germ, fish oil, salt | 16·95 | 4·00 | 4·50 | 1·00 | .... | 2·00 | .. | .... | 14 15 0 (W) |
| 5. *Chick Foods.* | | | | | | | | | | | | | |
| Chicken Mash .... | 29 | PATRIOT .... | J. & W. Bateman, Ltd. | Pollard, bran, meat meal, oat meal, powdered milk, bone meal, maize meal, chick feed | 15·80 | 4·20 | 4·30 | .... | .... | .. | .. | .. | 28 0 0 (P) |
| Chick Food .... | 30 | do. .... | do. do. do. | Cracked wheat, pannicum seed, broken peas, broken maize, shell grit | 11·80 | 3·00 | 3·80 | .... | .... | .... | .... | .... | 19 0 0 (P) |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chick Mash "A" | 46 | WESFARMERS | Westralian Farmers Co-operative, Ltd. | Wheat meal, pollard, bran, butter milk, maize meal, meat meal, liver meal*, cod liver oil, manganese sulphate, salt, calcium carbonate | 17·00 | 4·00 | 5·00 | Less than 1·00 | .... | $CaCo_3$ Less than 2·00 | Cod Liver Oil 2·00 | Manganese Sulphate Trace | £3 6 0 | (P) |
| Chick Mash "B" | 47 | do. | do. do. do. | Wheat meal, pollard, bran, maize meal, butter milk, meat meal, cod liver oil, calcium carbonate, salt | 15·00 | 4·00 | 5·00 | Less than 1·00 | .... | $CaCo_3$ Less than 2·00 | Cod Liver Oil 1·00 | .... | £2 6 0 | (P) |
| Chick Pellets "A" | 48 | RED COMB | do. do. do. | Wheat meal, pollard, bran, butter milk, maize meal, meat meal, liver meal*, cod liver oil, calcium carbonate, manganese sulphate, salt | 17·00 | 4·00 | 5·00 | Less than 1·00 | .... | 2·00 | Cod Liver Oil 2·00 | Manganese Sulphate Trace | £3 13 6 | (P) |
| Chick Pellets "B" | 49 | do. .... | do. do. do. | Wheat meal, pollard, bran, maize meal, butter milk, meat meal, cod liver oil, calcium carbonate, salt | 15·00 | 4·00 | 5·00 | Less than 1·00 | .... | $CaCo_3$ Less than 2·00 | Cod Liver Oil 1·00 | .... | £2 16 0 | (P) |
| Chick Food .... | 51 | ANCHOR .... | G. Wood, Son & Co., Ltd. | Rolled wheat, maize, yeast meal, butter milk powder, millet, oyster grit | 13·00 | 3·00 | 6·00 | .... | .... | .... | .... | .... | 18s. 6d. per doz. 6 lb. bags | |
| Chick Grain .... | 66 | CHIC CHIC .... | Barrow, Linton & Co. | Wheat, oats, maize, blue peas | 10·50 | 3·00 | 5·10 | .... | .... | .... | .... | .... | £2 17 6 | (W) |
| Chicken Grain .... | 82 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Wheat, maize, or Peas or oats*, shell grit | 12·50 | 2·30 | 5·50 | .... | .... | .... | .... | .... | £2 5 0 | (P) |
| Chick Starter .... | 83 | do. .... | do. do. do. | Wheat germ, bran, pollard, meat meal, cod liver oil, wheat meal, maize or pea meal*, milk powder, dried yeast*, dehydrated lucerne meal*, oat meal or rolled oats*, calcium carbonate, bone meal, oil meals*, fish meal*, sodium chloride | 16·50 | 4·00 | 6·00 | Max. 1·00 | .... | $CaCo_3$ Max. 3·75 | .... | .... | £3 0 0 | (P) |
| Chick Grower ... | 84 | do. .... | do. do. do. | Wheat germ, bran, pollard, meat meal, wheat meal, milk powder*, dried yeast*, dehydrated lucerne meal*, oat meal or rolled oats*, calcium carbonate, sodium chloride, fish meal* | 14·50 | 3·50 | 7·00 | Max. 1·50 | .... | $CaCo_3$ Max. 3·75 | .... | .... | £1 5 0 | (P) |

## STOCK FOODS—continued.

| Stock Food. | Reg. No. | Brand. | By whom Registered. | Materials from which Made. | Registered Analysis. | | | | | | | | Wholesale Price per ton at Works (W) or on rails, Perth (P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crude Protein. | Crude Fat. | Crude Fibre. | Sodium Chloride. | Phos. Acid ($P_2O_5$). | Lime (CaO). | Other. | | |
| | | | | | % | % | % | % | % | % | % | % | £ s. d. |
| Chicken Milk No. 1 | 85 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Milk powder, meat meal, bone meal, peanut or cocoanut meals*, dried yeast*, calcium carbonate, sodium chloride, fish meal* | 20·50 | 3·50 | 6·00 | Max. 3·00 | . . | Max. 15·00 | .... | | 17 10 0 (P) |
| Chicken Milk No. 2 | 86 | do. .... | do. do. do. | Milk powder, peanut or cocoanut meals*, wheat meal, dried yeast*, calcium carbonate, sodium chloride | 18·00 | 3·00 | 7·00 | Max. 3·00 | .... | Max. 15·00 | .... | .... | 17 10 0 (P) |
| Chick Builder .... | 96 | WESTERN .... | David Gray & Co., Ltd. | Pollard, bran, maize meal, wheat corn, butter milk, meat meal, bone meal, yeast, cod liver oil | 15·00 | 3·00 | 5·00 | . . | Max. 2·00 | 1·50 | .... | . . | 11 15 0 (P) |
| Chick Starter .... | 97 | do. .... | do. do. do. | Pollard, bran, maize meal, wheat meal, yeast, wheat germ, butter milk, bone meal, meat meal, cod liver oil | 17·00 | 3·00 | 4·50 | .... | 2·00 | 1·50 | .... | .... | 13 10 0 (P) |
| Chick Starter .... | 113 | MORLAY .... | Robert B. Young .... | Bran, wheat meal, maize meal, meat meal, bone meal, cod liver oil, butter milk powder, shell grit and minerals | 17·00 | 3·00 | 4·75 | ·98 | 2·10 | 5·00 | .... | .... | 15 5 0 (W) |
| Chick Mash .... | 114 | do. .... | do. do. .... | Wheat meal, bran, maize meal, meat meal, bone meal, butter milk powder, shell grit and minerals | 16·50 | 3·00 | 5·50 | 1·59 | 1·06 | 4·08 | . | . . | 13 15 0 (W) |
| Chick Allmash .... | 115 | do. .... | do. do. .... | Wheat meal, bran, maize meal, meat meal, bone meal, butter milk powder, shell grit and other minerals | 15·00 | 3·00 | 6·00 | 1·17 | 1·57 | 4·00 | .... | .... | 13 0 9 (W) |
| 6. *Pig Foods.* | | | | | | | | | | | | | |
| Pig Food .... .... | 19 | EVE-LYN .... | Tropical Traders, Ltd. .... | Pollard, linseed meal, linseed (whole), salt, lime stone, chalk, sulphur, animal charcoal, sulphate of iron, limonite, copper sulphate, medicinal herbs | 10·25 | 10·51 | 12·35 | 2·12 | 4·44 | 9·60 | Sulphur. 3·76 | Other Minerals and Herbs† 2·73 | 26 8 0 (P) |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pig Starter .... | 74 | THOMAS ... | W. Thomas & Co. (W.A.), Ltd. | Wheat, barley or oat meals, meat meal, dried blood. bone meal, oil meals*, dried yeast*, calcium carbonate, sodium chloride, fish meals* | 15·50 | 3·50 | 7·00 | 1·50 | .... | $CaCo_3$ 3·75 | .... | .... | 9 0 0 | (P) |
| Pig Grower .... | 75 | do. .... | do. do. do. | Wheat, oat or barley meals, malt screenings*, flax seed meal*, oil meals*, dried yeast*, calcium carbonate, sodium choride, meat and fish meal* | 14·00 | 4·50 | 7·50 | 1·50 | .... | 3·75 | .... | .... | 9 0 0 | (P) |
| Pig Milk .... .... | 120 | do. .... | do. do. do. | Milk powder, linseed or cocoanut or peanut meals*, wheat meal, dried yeast*, calcium carbonate, sodium chloride | 21·50 | 4·00 | 2·00 | Max. 3·00 | .... | 15·00 | .... | .... | 24 10 0 | (P) |
| 7. *Horse Foods.* | | | | | | | | | | | | | | |
| Horse Food .... | 22 | EVE-LYN .. . | Tropical Traders, Ltd. .... | Pollard, linseed meal, linseed (whole), wheat, salt, chalk, magnesium sulphate, sulphur, sulphate of iron, copper sulphate, sodium bicarbonate, medicinal herbs | 12·87 | 5·64 | 7·14 | 5·09 | 1·01 | 1·54 | Sulphur 1·84 | Other. 5·33 | †46 8 0 | (P) |
| Sweet Horse Meal | 88 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Bran, wheaten meal, oat meal, barley or wheaten screenings*, molasses, dried yeast, linseed meal*, sodium chloride, calcium carbonate | 15·00 | 3·00 | 10·00 | 1·50 | .... | $CaCo_3$ Max. 3·75 | .... | .... | 9 5 0 | (W) |
| 8. *Dog Foods.* | | | | | | | | | | | | | | |
| Dog Food .... | 6 | SNAPETTES.... | Albert E. Robinson .... | Wheat, bone, meat, vegetable | 15·25 | 13·00 | 4·00 | .... | 4·00 | CaO 5·00 | .... | .... | 4d. per lb. | |
| No. 1 Dog Biscuits | 7 | SNAPS .. . | do. do. .... | do. do. do. | 15·00 | 4·00 | 2·00 | .... | 3·50 | 4·00 | . .. | .... | 6d. per lb. | |
| Puppy Biscuits .... | 8 | do. .... | do. do. .... | do. do. do. | 15·00 | 4·00 | 2·00 | . .. | 3·50 | 4·00 | .... | .... | 6d. per lb. | |
| Hound Meal .... | 9 | do. .... | do. do. .... | do. do. do. | 15·00 | 4·00 | 3·00 | . .. | 2·50 | 2·50 | . .. | .... | 4d. per lb. | |
| Plain Shapes .... | 10 | do. .. | do. do. .... | do. do. do. | 15·00 | 4·00 | 2·00 | .... | 3·50 | 3·50 | . .. | . .. | 6d. per lb. | |
| Puppy Meal . .. | 11 | do. .... | do. do. . .. | do. do. do. | 15·00 | 4·00 | 2·00 | .... | 3·50 | 4·00 | .... | .... | 6d. per lb. | |
| Charcoal Shapes .... | 12 | do. .... | do. do. .... | Wheat, bone, meat, vegetable, charcoal | 14·00 | 3·00 | 6·00 | .... | 2·50 | 2·50 | . .. | .... | 6d. per lb. | |
| Bone Shapes .... | 13 | do. .... | do. do. .... | Wheat, bone, meat, vegetable | 15·00 | 4·00 | 2·00 | . .. | 3·50 | 4·00 | .... | .... | 6d. per lb. | |
| Dog Biscuits .... | 14 | BOANS LOCAL | do. do. .... | do. do. do. | 15·00 | 4·00 | 3·00 | . .. | 2·50 | 2·50 | .... | .... | 32s. per 100 lb. | |
| Bone Shapes . .. | 15 | SYMONDS . .. | do. do. .... | do. do. do. | 15·00 | 4·00 | 2·00 | . .. | 3·50 | 4·00 | .... | .... | 6d. per lb. | |
| C. STOCK LICKS | | | | | | | | | | | | | | |
| Di-calcic Lick .... | 50 | WESFARMERS | Westralian Farmers Co-operative, Ltd. | Salt, di-calcic phosphate .... | .... | .... | .... | 40·00 | 20·00 | 16·00 | .... | .... | 28 lb. bags 3s. 6d. each. | |
| Syko Lick or Mineral Stock Food | 52 | SYKES'S .... | Sykes's (Aust.) Drench Ltd. | Sodium chloride, manganese sulphate, sterilised bone flour, sulphur sublimate, ferrous sulphate, potassium iodide cobalt, sulphate copper sulphate | .... | .... | .... | 70·00 | 5·60 | 4·40 | 10·00 | 1·05 | 13s. per packet. | |
| Di-calcic Phosphate | 53 | C.S.M.L. .... | Cuming, Smith & Mt. Lyell F.F., Ltd. | Calcium phosphate, at least 90 per cent. of ($P_2O_5$) being as di-calcic phosphate | .... | .... | .... | .... | 37·00 | 28·00 | .... | .... | 20 18 3<br>21 18 3<br>22 18 3 | BF<br>Bu<br>Ge |

## STOCK FOODS—continued.

| Stock Food. | Reg. No. | Brand. | By whom Registered. | Materials from which Made. | Registered Analysis. | | | | | | | | Wholesale Price per ton at Works (W) or on rails, Perth (P.) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crude Protein. | Crude Fat. | Crude Fibre. | Sodium Chloride | Phos. Acid ($P_2O_5$). | Lime (CaO). | Other. | | | |
| | | | | | % | % | % | % | % | % | % Fe | % Cu | £ s. d. | |
| Copper Lick .... | 54 | C.S.M.L. .... | Cuming Smith & Mt. Lyell F.F., Ltd. | Di-calcic phosphate, copper sulphate, salt | .... | .... | .. | 66·00 | 12·50 | .... | .. | 0·10 | 11 13 10 | B |
| Denmark Lick Substitute | 55 | do. .. | do. do. do. | Limonite, sulphate of copper, salt | .... | .... | .... | 38·00 | .. | .... | 20·0 | 0·14 | 8 11 3<br>9 12 11 | B<br>Bu |
| Di-calcic Lick .... | 90 | THOMAS .... | W. Thomas & Co. (W.A.), Ltd. | Sodium chloride, calcium carbonate, trical-os, bone flour | .... | .... | .. | 37·00 | 16·00 | 33·00 | .. | Minerals | 11 0 0 | (P) |
| Medicated Lick .... | 94 | VETAMAC .... | A. H. McDonald & Co. ... | Salt, sulphate of iron, sodium, bi-carbonate, sulphur, magnesium sulphate, bone meal, potassium iodide, molasses, whole meal, aloes | ... | .... | .... | 53·00 | 5·70 | 7·50 | .. | 4·75 | 23 12 0 | (P) |
| Mineral Concentrate | 95 | VETSOLICK.... | do. do. do. | Bone meal, sulphur, sodium bi-carbonate, magnesia sulphate, whole meal, sulphate of iron, carbo ligni, potassium iodide | .. | .. | .. | *Nil* | 11·00 | 14·00 | .... | 18·8 | 27 14 0 | (P) |
| Cobaltised and Copperised Concentrate D for Sheep | 127 | VITA LICK .... | Goldsbrough Mort & Co., Ltd. | Bone flour (degelatinised), bone charcoal, sodium sulphate (anhydrous). sulphur, limonite, potassium iodide, copper sulphate, cobalt chloride and meals derived from by-products of rice, cocoa and wheat | .... | .. | .. | *Nil* | 23·50 | 30·00 | Max. Meals 21·50 | 5·10 | 32 10 0 | (P) |
| Cobaltised and copperised Mixed D for Sheep | 125 | do. .... | do. do. do. | Bone flour (degelatinised), bone charcoal, sodium sulphate (anhydrous), sulphur, limonite, potassium iodide, copper sulphate, cobalt chloride and meals derived from by-products of rice, cocoa and wheat | .... | .... | .. | Max 80·00 | 3·70 | 4·70 | 3·39 Molasses 3·50 | 0·78 | 11 10 0 | (P) |
| Cobaltised and copperised concentrate G for Sheep | 128 | do. .... | do. do. do. | Bone flour (degelatinised), bone charcoal, limonite, flowers of sulphur, potassium iodide, copper sulphate, cobalt chloride, and meals derived from by-products of rice, cocoa and wheat | .... | .... | .... | *Nil* | 23·50 | 31·00 | Meals 12·70 | 7·52 | 32 10 0 | (P) |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cobaltised and copperised Mixed G for Sheep | 126 | do. .... | do. | do. | do. | Bone flour (degelatinised), bone charcoal, limonite, flowers of sulphur, potassium iodide, copper sulphate, cobalt chloride, and meals derived from the by-products of rice, cocoa and wheat | .... | .... | .... | Max. 80·00 | 3·80 | 4·90 | 2·00 Molasses 3·00 | 1·20 | 11 | 10 | 0 (P) |
| Cobaltised and copperised Cattle Lick Concentrate D | 121 | do. .... | do. | do. | do. | Bone flour (degelatinised), bone charcoal, sodium sulphate (anhydrous), flowers of sulphur, potassium iodide, copper sulphate, cobalt chloride, and rice, cocoa and wheat meals | .... | .... | .... | *Nil* | 21·70 | 29·00 | Max. Meals 15·30 | 7·20 | 32 | 10 | 0 (P) |
| Cobaltised and copperised Cattle Lick Concentrate G | 122 | do. .... | do. | do. | do. | Bone flour (degelatinised), bone charcoal, sodium sulphate (anhydrous), flowers of sulphur, potassium iodide, copper sulphate, cobalt chloride, and rice, cocoa and wheat meals | .... | .... | .... | *Nil* | 25·00 | 32·50 | 10·20 | 5·85 | 32 | 10 | 0 (P) |
| Cobaltised and copperised Cattle Lick Mixed D | 123 | do. .... | do. | do. | do. | Bone flour (degelatinised), bone charcoal, sodium sulphate (anhydrous), flowers of sulphur, potassium iodide, copper sulphate, cobalt chloride, and rice, cocoa and wheat meals | .... | .... | .... | Max. 75·00 | 4·20 | 5·40 | 3·10 Molasses 5·00 | 1·60 | 12 | 0 | 0 (P) |
| Cobaltised and copperised Cattle Lick Mixed G | 124 | do. .... | do. | do. | do. | Bone flour (degelatinised), bone charcoal, sodium sulphate (anhydrous), flowers of sulphur, potassium iodide, copper sulphate, cobalt chloride, rice, cocoa, and wheat meals | .... | .... | .... | Max. 75·00 | 4·40 | 5·80 | Max. Meals 1·93 Molasses 5·00 | 1·40 | 12 | 0 | 0 (P) |
| Vita Lick Mineral Mixture | 120 | V.M.M. .... | do. | do. | do. | Bone flour (degelatinised), bone charcoal, Spanish iron oxide, ferrous sulphate, flowers of sulphur, sodium sulphate (anhydrous), and meals derived from rice and cocoanut | .... | .... | .... | 4·30 | 9·50 | 12·50 | Max. Meals 60·20 | 4·47 | 19 | 10 | 0 (P) |
| Mineralised Blocks | 119 | VITA LICK | do. | do. | do. | Carbonate of lime, sulphur, sulphate of iron, salt, potassium iodide, cobalt chloride | .... | .... | .... | Max. 76·00 | .... | 9·50 | .... | 0·72 | 16 | 10 | 0† (P) |

**STOCK FOODS**—continued.

| Stock Food. | Reg. No. | Brand. | By whom Registered. | Materials from which Made. | Registered Analysis. | | | | | | | | Wholesale Price per ton at Works (W) or on rails, Perth (P.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Crude Protein. | Crude Fat. | Crude Fibre. | Sodium Chloride. | Phos. Acid ($P_2O_5$). | Lime (CaO). | Other. | | |
| | | | | | % | % | % | % | % | % | % | % | £ s. d. |
| Chic-a-Vite .... | 118 | CHIC-A-VITE | Goldsbrough, Mort & Co., Ltd. | Bone flour (degelatinised), bone charcoal, ferrous sulphate, flowers of sulphur, sodium sulphate (anhydrous), gentian, cod liver oil, potassium iodide, and meal derived from by-products of rice | .... | .... | .... | *Nil* | 20·70 | 27·6 | Max. Meals 16·50<br>Cod Liver Oil 2·50 | 10·39 | 36 0 0 (P) |
| Por-co-vite .... | 129 | POR-CO-VITE | do. do. do. | Bone flour (degelatinised), bone charcoal, sodium sulphate (anhydrous), flowers of sulphur, sodium chloride, limonite, calcium carbonate, copper sulphate, cobalt chloride, potassium iodide, and cod liver oil | .... | .... | .... | 13·00 | 19·10 | 30·00 | Cod Liver Oil 3·56 | 12 90 | 35 0 0 (P) |

BF, Bassendean-Fremantle. Bu, Bunbury. Ge, Geraldton. * Included only when available. † Short ton. ‡ Cost at Works.

# Errata.

In the *Journal of Agriculture*, Vol. XXIII., No. 1, March, 1946:—

Page 22, paragraph 6, line 6, for "It is possible however, that the lack of sensitivity of the Resazurin to cell content . . . " to read "It is not possible . . . "

Page 22, paragraph 6, last line for "considerably increased compared with the freshly drawn sample" substitute "considerably decreased compared with the freshly drawn sample."

Page 42, "Flax Rust in Western Australia," line 1, for "Flax rust is caused by a fungus *Melampsore lini*" read "Flax rust is caused by *Melampsora lini.*"

Page 45, References, (3) ———————— 1944, for "Further determinations of Specialisation in Flax Rust caused by *Melampsore lini*" read "Further determinations of Specialisation in Flax Rust caused by *Melampsora lini.*"

In the *Journal of Agriculture*, Vol. XXIII., No. 2, June, 1946, page 135, for "COMEBACK AND CROSSBRED FLOCKS OF UP TO 500 SHEEP" in the second heading read "COMEBACK AND CROSSBRED FLOCKS OF OVER 500 SHEEP."